

SFUND RECORDS CTR
2253248

Final Technical Memorandum for Data Gap Investigation of Soil Under Buildings on Parcel C

Hunters Point Shipyard
San Francisco, California

September 2010
Document Control No: KCH-2622-0003-0039

Contract No: N62473-09-D-2622

CTO No: 0003

Prepared for:



Prepared by:





DEPARTMENT OF THE NAVY
BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE WEST
1455 FRAZEE RD, SUITE 900
SAN DIEGO, CA 92108-4310

Ser BPMOW.bjb/0842
SEP 30 2010

Mark Ripperda (SFD-8-3)
U.S. Environmental Protection Agency
(Region IX)
75 Hawthorne Street
San Francisco, CA 94105-3901

Ryan Miya
California Environmental Protection Agency
Department of Toxic Substance Control
700 Heinz Avenue, Bldg. F, Suite 200
Berkeley, CA 94710-2721

Ross Steenson
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear BCT members:

Enclosed please find the *Final Technical Memorandum for Data Gap Investigation of Soil Under Buildings on Parcel C, Hunters Point Shipyard, San Francisco, California, July 2010.*

Should you have any questions or concerns, please contact me at (619) 532-0913 or Bob Hunt at (619) 532-0962.

Sincerely,

KEITH FORMAN
BRAC Environmental Coordinator
By direction of the Director

Enclosure: 1. Final Technical Memorandum for Data Gap Investigation of Soil Under Buildings on Parcel C, Hunters Point Shipyard, San Francisco, California, September 2010.

SEP 30 2010

2 Hard Copies Bound, 1 Hard Copy Unbound, and 1 CD to:

Diane Silva
NAVFAC SWDIV Code EV33
Admin Records
NBSD Bldg 3519
2965 Mole Road
San Diego, CA 92136

1 CD only to:

Amy Brownell
City of San Francisco
Department of Public Health
1390 Market Street, Suite 210
San Francisco, CA 94102

Randy Brandt
Geosyntec Consultants
475 14th Street, Suite 400
Oakland, CA 94612

Stephen Proud
Lennar
1 California St., Suite 2700
San Francisco, CA 94124

Michael Sharpless
Paul Hastings, et al.
55 2nd Street, 24th floor
San Francisco, CA 94104-2635

Kristine Enea
951 Innes Avenue
San Francisco, CA 94124

Final

Technical Memorandum for Data Gap Investigation of Soil under Buildings on Parcel C

Hunters Point Shipyard, San Francisco, California

NAVFAC Southwest CLEAN IV Program

Contract Number: N62473-09-D-2622

Contract Task Order 0003

Document Control Number: KCH-2622-0003-0039

Prepared for

**U.S. Department of the Navy (Navy)
Base Realignment and Closure (BRAC)
Project Management Office West**



September 2010

Prepared by



**CH2M HILL Kleinfelder,
A Joint Venture (KCH)**

4

This page intentionally left blank.

Final

Technical Memorandum for Data Gap Investigation of Soil under Buildings on Parcel C

Hunters Point Shipyard, San Francisco, California

NAVFAC Southwest CLEAN IV Program

Contract Number: N62473-09-D-2622

Contract Task Order 0003

Document Control Number: KCH-2622-0003-0039

Prepared for

U.S. Department of the Navy (Navy)
Base Realignment and Closure (BRAC)
Project Management Office West

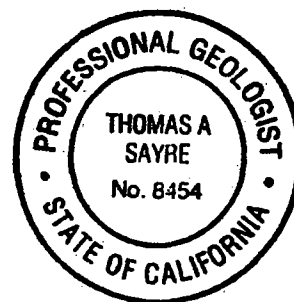


September 2010

Prepared by



CH2M HILL Kleinfelder,
A Joint Venture (KCH)



Review Signature: _____

Thomas A Sayre, P.G., Project Geologist

September 30, 2010

Date

Approval Signature: _____

Gary Goodenote, Task Order Manager

September 30, 2010

Date

This page intentionally left blank.

Executive Summary

CH2M HILL Kleinfelder, a Joint Venture (KCH) has prepared this Technical Memorandum (TM) for a data gap investigation of soil under certain buildings in Parcel C, Hunters Point Shipyard (HPS), San Francisco, California. This work was performed for the U.S. Department of the Navy (Navy), Base Realignment and Closure (BRAC) Project Management Office West, in accordance with Contract No. N62473-09-D-2622. The investigation was conducted and reported by KCH.

The Navy is in the process of preparing the Record of Decision (ROD) for Parcel C and the Total Petroleum Hydrocarbon Corrective Action Plan (TPH CAP) and eventually the remedial design and subsequent remedial action(s). The ROD will identify the selected remedy for remediation at Parcel C. In order to complete the ROD for Parcel C, the Navy needs to assess the extent of contamination under the foundations of buildings 134, 203, 214 and 231.

Prior to starting this Data Gap Investigation, the Navy reviewed the available data for soil under and surrounding the buildings on Parcel C. The data evaluation identified four buildings for further investigation: Buildings 134, 203, 214, and the eastern portion of Building 231.

The specific goals of this investigation, as described in the Work Plan (KCH, 2009b), are to provide additional analytical data for soil under buildings that will be incorporated into the ROD, remedial design and subsequent remedial action for Parcel C and the TPH CAP. Specifically, the investigation goals include the following:

1. Provide data to evaluate whether contaminants of concern are present in soil under Building 134.
2. Provide data to evaluate whether contaminants of concern are present in soil under Building 203.
3. Provide data to evaluate whether contaminants of concern are present in soil under Building 214.
4. Provide data to evaluate whether contaminants of concern are present in soil under Building 231E.

To meet these objectives, the following scope of work was performed:

1. Collect soil samples from 13 boreholes located within certain buildings using a hand auger and slide hammer type sampler.
2. Collect soil samples from one angled borehole located adjacent to Building 214 using direct push technology (DPT).
3. Collect soil samples from three step-out boreholes located adjacent to Building 214 using a hand auger and slide hammer type sampler or DPT.

4. Conduct a location and elevation survey for the borehole locations.

Analytical data generated by this investigation are presented in Section 5 of this report.

Contents

Executive Summary.....	iii
Acronyms and Abbreviations	ix
1. Introduction.....	1-1
1.1 Project Objectives.....	1-1
1.2 Scope of Work	1-2
2. Site History and Description.....	2-1
2.1 Hunters Point Shipyard Parcel C Background.....	2-1
2.2 Physical Setting	2-1
2.3 Site Description.....	2-2
2.3.1 Site Use.....	2-2
2.3.2 Hydrogeology	2-3
2.4 Summary of Previous Investigations and Remedial Actions.....	2-5
3. Regulatory Framework.....	3-1
3.1 Principal Decision Makers	3-1
3.2 Technical or Regulatory Standards.....	3-1
3.3 Permitting Requirements	3-1
4. Soil Sampling.....	4-1
4.1 Preparatory Activities.....	4-1
4.2 Soil Boreholes and Sampling	4-2
4.2.1 Initial Boreholes	4-2
4.2.2 Step-out Boreholes.....	4-3
4.2.3 Deviations from Final SAP.....	4-4
4.3 Field Equipment Decontamination.....	4-4
4.4 Borehole Decommissioning	4-4
4.5 Investigation-Derived Waste	4-4
4.6 Location Surveying	4-5
4.7 Safety and Health	4-5
5. Soil Analytical Results	5-1
5.1 Building 134.....	5-1
5.1.1 Copper.....	5-1
5.1.2 Methyl Tertiary Butyl Ether (MTBE)	5-2
5.1.3 Polycyclic Aromatic Hydrocarbons (PAHs) / Semivolatile Organic Compounds (SVOCs)	5-2
5.1.4 Naphthalene.....	5-2
5.1.5 Total Petroleum Hydrocarbons (TPH) - Extractable	5-2
5.1.6 Total Petroleum Hydrocarbons (TPH)- Purgeable	5-2
5.1.7 Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)	5-3

5.2	Building 203	5-3
5.2.1	Naphthalene	5-3
5.2.2	Polycyclic Aromatic Hydrocarbons (PAHs) / Semivolatile Organic Compounds (SVOCs)	5-3
5.2.3	Copper	5-3
5.2.4	Lead	5-4
5.2.5	Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)	5-4
5.2.6	Manganese	5-4
5.2.7	Mercury	5-4
5.2.8	Polychlorinated Biphenyls (PCBs) (Aroclor 1260)	5-4
5.2.9	Total Petroleum Hydrocarbons (TPH) – Extractable	5-4
5.2.10	Organic Lead	5-5
5.3	Building 214	5-5
5.3.1	Lead	5-5
5.3.2	Polycyclic Aromatic Hydrocarbons (PAHs) / Semivolatile Organic Compounds (SVOCs)	5-5
5.4	Building 214 Step-out	5-6
5.4.1	Lead	5-6
5.4.2	Polycyclic Aromatic Hydrocarbons (PAHs) / Semivolatile Organic Compounds (SVOCs)	5-6
5.5	Building 231E	5-6
5.5.1	Lead	5-6
5.5.2	Methyl Tertiary Butyl Ether (MTBE)	5-6
5.5.3	Polycyclic Aromatic Hydrocarbons (PAHs) / Semivolatile Organic Compounds (SVOCs)	5-7
5.5.4	Total Petroleum Hydrocarbons (TPH) – Extractable	5-7
5.5.5	Total Petroleum Hydrocarbons (TPH) – Purgeable	5-7
5.5.6	Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)	5-7
6.	Data Quality, Verification, and Validation	6-1
6.1	Quality Control Samples	6-1
6.2	Data Quality Assessment	6-1
7.	Recommendations	7-1
7.1	Building 134	7-1
7.2	Building 203	7-1
7.3	Building 214	7-1
7.4	Building 231E	7-1
8.	References	8-1

Tables

- 1 Sample Summary for Soil and Field Quality Control Samples
- 2 Detected Results and Regulatory Criteria Exceedances from Building 134 Soil Samples
- 3 Detected Results and Regulatory Criteria Exceedances from Building 203 Soil Samples
- 4 Detected Results and Regulatory Criteria Exceedances from Building 214 Soil Samples
- 5 Detected Results and Regulatory Criteria Exceedances from Building 231E Soil Samples
- 6 Analytical Results from Field Quality Control Samples

Figures

- 1 Basewide Site Plan
- 2 Site Plan – Parcel C
- 3 Soil Sampling Locations and Results– Building 134
- 4 Soil Sampling Locations and Results – Building 203
- 5a Soil Sampling Locations and Results – Building 214
- 5b Step Out Soil Sampling Locations and Results – Building 214
- 6 Soil Sampling Locations and Results – Building 231E
- 7 Decision Tree for Evaluation of Soil Data Under Parcel C Buildings

Appendices

- A Personnel Signoff Sheets
- B Summary of Selection Process for Additional Soil Removal Areas Identified in Parcel C
- C Borehole Logs
- D Chain-of-custody Forms
- E Laboratory and Data Validation Reports (CD-ROM only)
- F Response to Comments Table

This page intentionally left blank.

Acronyms and Abbreviations

°C	degrees Celsius
µg/kg	micrograms per kilogram
APPL	Agriculture and Priority Pollutants Laboratory, Inc.
ARAR	Applicable or Relevant and Appropriate Requirements
ARIC	area requiring institutional controls
BCT	BRAC Cleanup Team
BGS	below ground surface
BMP	Best Management Practice
BRAC	Base Realignment and Closure
BTEX	benzene, ethylbenzene, toluene, and xylenes
CAP	Corrective Action Plan
CCR	California Code of Regulations
CE2	CE2 Corporation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DHS	California Department of Health Services
DOD	U.S. Department of Defense
DOT	Department of Transportation
DPT	direct-push technology
DQA	data quality assessment
DQO	data quality objective
DTSC	California Department of Toxic Substances Control
EDV	Environmental Data Validation, Inc.
ELAP	Environmental Laboratory Accreditation Program
FS	Feasibility Study
GIS	geographical information system

HDPE	high-density polyethylene
HPS	Hunters Point Shipyard
IDW	investigation-derived waste
IR	Installation Restoration
KCH	CH2M HILL Kleinfelder, a Joint Venture
LCS	laboratory control sample
MDL	method detection limit
mg/kg	milligrams per kilogram
msl	mean sea level
MS/MSD	matrix spike/matrix spike duplicate
MTBE	methyl tertiary butyl ether
NAVFAC	Naval Facilities Engineering Command
Navy	United States Department of the Navy
NEDD	Naval Electronic Data Deliverable
NELAP	National Environmental Laboratory Accreditation Program
NFESC	Naval Facilities Engineering Service Center
NIRIS	Naval Installation Restoration Information Solution
NNP	non-Navy property
NPL	National Priorities List
NRDL	Naval Radiological Defense Laboratory
PAH	polycyclic aromatic hydrocarbon
PARCCS	precision, accuracy, representativeness, comparability, completeness, and sensitivity
PCBs	polychlorinated biphenyls
PID	photoionization detector
PP	Proposed Plan
PPE	personal protective equipment
QC	quality control
ROD	Record of Decision
ROICC	Resident Officer in Charge of Construction

RPD	relative percent difference
RPM	Remedial Project Manager
Water Board	California Regional Water Quality Control Board, San Francisco Bay Region
SAP	Sampling and Analysis Plan
SOP	standard operating procedure
SSHP	Site-Specific Safety and Health Plan
SVOC	semivolatile organic compound
T&D	transportation and disposal
TM	Technical Memorandum
TMZ	Tidal Mixing Zone
TPH	total petroleum hydrocarbons
TPH-E	total petroleum hydrocarbons – extractable
TPH-P	total petroleum hydrocarbons – purgeable
USEPA	United States Environmental Protection Agency
USC	United States Code
USCS	Unified Soil Classification System
VOC	volatile organic compound

This page intentionally left blank.

1. Introduction

CH2M HILL Kleinfelder, a Joint Venture (KCH) has prepared this Technical Memorandum (TM) for a data gap investigation of soil under selected buildings in Parcel C, Hunters Point Shipyard (HPS), San Francisco, California. This work was performed for the U.S. Department of the Navy (Navy), Base Realignment and Closure (BRAC) Project Management Office West, in accordance with Contract No. N62473-09-D-2622.

This data gap investigation was part of ongoing efforts by the Navy to address contamination at HPS Parcel C in accordance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) by providing data for use in preparing the Record of Decision (ROD) for Parcel C, to provide additional data for the Total Petroleum Hydrocarbon Corrective Action Plan (TPH CAP) and eventually to provide data for use in the remedial design and subsequent remedial action(s). The Navy conducted a comprehensive evaluation of soil chemical analysis data in the vicinity of existing buildings at Parcel C in 2009. This evaluation was conducted to address BRAC Cleanup Team (BCT) concerns that chemicals of concern (COCs) may not be adequately characterized beneath the buildings at Parcel C.

The data gap investigation under the buildings of Parcel C was conducted by KCH with portions of the work subcontracted to a concrete coring firm, a direct push technology (DPT) drilling firm, analytical laboratories, a third-party data validation company, and a land surveyor. The project was conducted in accordance with the following planning documents:

- *Final Work Plan Data Gap Investigation of Soil Under Buildings on Parcel C, Hunters Point Shipyard, San Francisco, California* (the Work Plan; KCH, 2009b).
- *Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) for Data Gaps Investigation of Soil under Buildings on Parcel C* (the Final SAP; KCH, 2009c). This document was published as Appendix A to the Work Plan.

Prior to implementing the work under the above documents, key personnel reviewed the Final SAP as indicated in the Personnel Sign-off Sheets included in Appendix A.

1.1 Project Objectives

The objective of this data gap investigation was to further assess the extent of contamination under the foundations of the buildings and document the need for potential further action under certain buildings on Parcel C should the foundations be removed. The results from this data gap investigation will be used in the ROD for Parcel C to identify the need for further remedial action if building foundations are removed and to provide additional data for the TPH CAP. Building foundations will be considered part of the engineering controls used to protect future use from adverse risk due to potential exposure to identified contaminants. Potential further actions may include one or more of the following: additional sampling, replacement of foundations, excavation or removal of soils, and/or placement of asphalt caps.

Field work, sample analysis, and data validation was done as expeditiously as possible. This scope included a 48-hour turn-around on preliminary sample analysis to keep the project moving and to expedite the determination of whether step-out sampling was needed.

The purpose of this investigation was to obtain additional information regarding the lateral extent of various analytes in soil under selected buildings in Parcel C, as summarized in the matrix below:

Building	Analysis											
	Copper	Lead	Manganese	Organic Lead	Mercury	Total Petroleum Hydrocarbons - purgeable	Total Petroleum Hydrocarbons - extractable	Aroclor-1260	Benzene, Toluene, Ethylbenzene, Xylenes	Methyl Tertiary Butyl Ether	Naphthalene	Semivolatile Organic Compounds / Polycyclic Aromatic Hydrocarbons
134	X					X	X		X	X	X	X
203	X	X	X	X	X		X	X	X		X	X
214		X										X
231E		X				X	X		X	X		X

The specific goals of this investigation, presented below, were to provide additional analytical data for soil under buildings that will be incorporated into the ROD, remedial design and subsequent remedial action for Parcel C:

1. Provide data to evaluate whether contaminants of concern exceeding the Parcel C remedial goals for soil are present in soil under Building 134.
2. Provide data to evaluate whether contaminants of concern exceeding the Parcel C remedial goals for soil are present in soil under Building 203.
3. Provide data to evaluate whether contaminants of concern exceeding the Parcel C remedial goals for soil are present in soil under Building 214.
4. Provide data to evaluate whether contaminants of concern exceeding the Parcel C remedial goals for soil are present in soil under Building 231E.

1.2 Scope of Work

The site investigation was implemented using the following approach:

1. Collect soil samples from 13 boreholes located within certain buildings using a hand auger and slide hammer type sampler.

2. Collect soil samples from one angled borehole located adjacent to Building 214 using DPT.
3. Collect soil samples from three step-out boreholes located adjacent to Building 214 using DPT.
4. Survey the location and elevation of the borehole locations.

This page intentionally left blank.

2. Site History and Description

The location of HPS and parcel divisions within HPS are shown in Figure 1. Figures are located at the end of this TM. Figure 2 shows Parcel C and investigation locations where the scope of work was performed.

2.1 Hunters Point Shipyard Parcel C Background

HPS was owned and operated as a commercial dry dock facility until 1939, when the Navy purchased the property from Bethlehem Steel. Upon the entry of the U.S. into World War II in 1941, the Navy immediately began to expand HPS into a naval shipyard. The Navy began excavation of the hills surrounding the shipyard, using the resulting spoils to expand the shoreline into the Bay. Quays, docks, and support buildings were built on an expedited wartime schedule to support the shipyard's mission of fleet repair and maintenance.

Parcel C historically included about 79 acres in the central portion of the shipyard (Figure 1). Parcel C was formerly part of the industrial support area used for shipping, ship repair, and office and commercial activities. Industrial support facilities for ship repair dominated the land use at Parcel C. These support facilities included a foundry, a power plant, a sheet manufacturing shop, a paint shop, and various machine shops; 70 buildings are located within the boundaries of Parcel C. The docks at Parcel C were formerly part of the industrial production area. Portions of Parcel C were also used by Naval Radiological Defense Laboratory (NRDL). In 2002, the boundaries of Parcels B and C were redefined, and Installation Restoration (IR) sites IR-06 and IR-25 became part of Parcel C. In 2008, the Navy divided the former Parcel C into two new parcels: Parcel C and Parcel UC-2. The current Parcel C is about 74 acres in size. HPS was identified as a National Priorities List (NPL) site by the U.S. Environmental Protection Agency (USEPA) in 1989. As a result, the Navy is conducting investigations in accordance with CERCLA (Title 42 *United States Code* [USC] Sections [§§] 9601-9675) at HPS sites where releases of CERCLA hazardous substances have occurred. As a management tool to accelerate site investigation, cleanup, and reuse, HPS was divided into geographic parcels and IR sites within each parcel that are evaluated concurrently. (Navy, 2009a).

HPS is currently divided into ten parcels: Parcels B, C, D-1, D-2, E, E-2, F, G, UC-1, and UC-2 (Figure 1). In 1992, the Navy divided HPS into five contiguous parcels (A, B, C, D, and E) to aid in coordination and tracking of environmental investigation and cleanup. In 2008, the Navy divided Parcel C into two parcels (C and UC-2) to aid in coordination and tracking of environmental investigation and cleanup.

2.2 Physical Setting

Parcel C is bounded by other portions of HPS, private property, and San Francisco Bay. Historically, the dominant land use of Parcel C has been for shipping, ship repair, and office and commercial activities. According to the City and County of San Francisco's

Redevelopment Plan, Parcel C will be zoned for the following reuses: research and development, mixed uses, educational and cultural, open space, and maritime/industrial uses (Navy, 2009b).

Parcel C currently consists of 74 acres of shoreline and lowland coast located along the northeastern portions of HPS (Figure 2). Parcel C is bounded by:

- Portions of Parcel B and the San Francisco Bay (Parcel F) to the north.
- Portions of Parcel D-1 and the San Francisco Bay (Parcel F) to the south.
- The San Francisco Bay (Parcel F) to the east.
- Portions of Parcel B, Parcel UC-2, and Parcel G to the west

The maximum ground surface elevation in Parcel C is about 28 feet above mean sea level (msl). Most surface elevations in Parcel C are between 0 to 10 feet above msl. More than 90 percent of Parcel C is covered by pavement and former industrial buildings. There are 70 buildings located within boundaries of Parcel C.

Although Parcel C fuel and steam lines were removed or closed in 2002, the storm drains and sanitary sewer lines beneath the parcel remain key site characteristics. Storm drain and sanitary sewer lines in Parcel C will be removed per the Parcel C Radiological Removal Action.

2.3 Site Description

The western portion of Parcel C comprises the original promontory, with native soil over shallow bedrock, while the majority of the parcel consists of level lowlands. The lowlands were constructed by placing fill material from various sources, including crushed serpentinite bedrock from the adjacent highland, construction debris, and waste materials (such as used sandblast materials) (Navy, 2009a).

The general pattern of groundwater flow is radially away from the former Parcel A topographic high (west of Parcel C) and toward the shoreline (Navy, 2009a). At Parcel C, the general direction of groundwater flow is to the east, where groundwater discharges into the bay.

2.3.1 Site Use

The previous uses and background for the buildings that were investigated as part of this scope of work are summarized in this section, as described in the scope of work provided by the Navy on June 22, 2009 (Navy, 2009b). Figure 2 shows Parcel C and investigation locations where the scope of work was performed.

Building 134 has contained offices, machine shops, a refrigeration repair shop, an industrial quality and reliability assurance laboratory, and storage facilities. A dip tank labeled "chlorinated materials" was built into the foundation and drained to a sump partially inside and partially outside of the building. An oil and water separator that connects to the sump drains was located outside of Building 134. Sludge and oily waste were observed in the dip tank and sump in 1991; both the dip tank and sump have been removed. In one area of the machine shop, floor tile was observed saturated with, and deformed by, oil and corrosive material. A utility vault is present in the southwestern exterior of the building. Fuel

distribution lines passed beneath the central part of Building 134; these lines have been removed. Fuel lines adjacent to the north and east sides of Building 134 were removed during removal actions at Parcel B in 2001 (Navy, 2009b).

Building 203 was a Power Plant and Boiler Room through 1974. After 1974 the building was just a Power Plant. Polychlorinated biphenyls (PCBs) are found in limited areas, apparently associated with transformers, particularly around Building 203 (Navy, 2009b).

Building 214 housed the Combat Weapons office while the shipyard was operating. Post-Navy, it was used as offices (Navy, 2009a).

Building 231, located immediately north of Buildings 211 and 253 and south of Dry Dock 2, was historically used for heavy industrial machining. The building housed several air treatment systems, sumps, sandblasting rooms, a boiler, and subfloor trenches and piping. Five former underground storage tanks are located north and east of Building 231; three of these were removed in 1991 and the remaining two were closed in place. The tanks stored diesel and fuel oil. For this investigation, Building 231 has been divided into two sections, east and west, and shall be referred to as Building 231E and Building 231W (Navy, 2009b).

2.3.2 Hydrogeology

The following is a summary of information provided in the *Final Work Plan for Contamination Delineation at Remedial Unit C5* (CE2, 2005). Conceptual summaries of the stratigraphy, hydrostratigraphy, recharge-discharge areas, and groundwater flow are presented below.

2.3.2.1 Stratigraphy

Five principal geologic units have been defined at HPS (CE2, 2005). In order of increasing depth and approximate age (from youngest to oldest), these units are:

Artificial Fill (Qaf) – Most of the land area for HPS was created using quarried rock from upland areas. The artificial fill consists primarily of serpentinite with lesser amounts of dredged marshland deposits. The artificial fill also contains pockets of industrial fill consisting of building debris and sandblast grit. As a result, the artificial fill is a heterogeneous mixture of unconsolidated material with a wide range of grain sizes. The artificial fill overlies natural sediments or bedrock, depending on the location. The variable thickness of the artificial fill reflects erosional features, such as stream channels in the natural sediments and an uneven bedrock surface. A relatively thin unit of colluvial debris and ravine fill underlies the artificial fill at scattered locations.

Undifferentiated Upper Sands (Quus) – This naturally occurring unit is comprised of poorly graded, discontinuous estuarine, lagoonal, and alluvial sand deposits that overlie, but in places interbed with, the underlying Bay Mud. These sands may also directly overlie bedrock.

Bay Mud (Qbm) – The Bay Mud unit consists of estuarine sediments that are predominantly composed of silt and clay, but may include clayey or silty sands. The Bay Mud may underlie either artificial fill or the upper sand deposits, and may overlie the deeper undifferentiated sediments or bedrock. The Bay Mud is occasionally interbedded with the upper Undifferentiated Upper Sands unit.

Undifferentiated Sediments (Qu) - This unit consists of naturally occurring unconsolidated silty or clayey sands containing discontinuous, isolated sand lenses. These sediments can underlie any of the younger units.

Franciscan Complex Bedrock (Kf) - The bedrock consists primarily of serpentinite and minor amounts of metamorphosed basalt (greenstone) or shale. Bedrock competency is variable and fractures are common. The bedrock surface is irregular across the HPS.

2.3.2.2 Hydrostratigraphy

Four hydrostratigraphic units have been defined at HPS (CE2, 2005):

A-Aquifer - The unconfined A-Aquifer is present primarily in the artificial fill and also in the Undifferentiated Upper Sands unit. At scattered locations at HPS, the A-Aquifer has been subdivided into A-1, A-2 and A-3 units to reflect discrete and localized water-bearing zones. In some locations, the groundwater in shallow fractured bedrock is in hydraulic connection with the A-Aquifer.

Bay Mud Aquitard - The discontinuous Bay Mud Aquitard separates the A-Aquifer from the B-Aquifer, where present.

B-Aquifer - The B-Aquifer is discontinuous across HPS. Where present, the B-Aquifer is typically under semiconfined conditions in Undifferentiated Sediments that directly underlie the A-Aquifer where the Bay Mud Aquitard is absent.

Bedrock Water-Bearing Zone - The Bedrock Water-Bearing Zone consists of isolated pockets of fractured bedrock that are not hydraulically connected to upper hydrostratigraphic units.

2.3.2.3 Recharge and Discharge

Most groundwater recharge at HPS has historically occurred by direct infiltration of precipitation falling on the upland areas on non-Navy property (NNP), and by precipitation falling on unpaved areas on-site (CE2, 2005). Most precipitation at HPS occurs during November through April. Groundwater discharges at HPS from the A-Aquifer to San Francisco Bay along a Tidal Mixing Zone. Vertical gradients suggest that groundwater can flow either upward or downward between the A-Aquifer and B-Aquifer depending on localized conditions, where the Bay Mud Aquitard is absent.

2.3.2.4 Groundwater Flow Direction

Two distinct water-bearing zones have been identified at HPS, the A-Aquifer and the semi-confined B-Aquifer (CE2, 2005).

A-Aquifer

Groundwater in the A-Aquifer generally flows from NNP upland recharge areas toward San Francisco Bay. In Parcel C, groundwater flows uniformly toward the Bay, except for disturbances that may be caused by preferential flow along subsurface utilities. Groundwater elevations in Parcel C typically range from 0 to 10 feet above msl.

Natural heterogeneities and anthropogenic features have created preferential groundwater pathways in the A-Aquifer. The natural heterogeneities consist of stratigraphic

discontinuities and facies changes. The anthropogenic features are comprised of heterogeneous pockets of artificial fill and an extensive system of buried utilities. Building foundations and dry docks can also influence groundwater migration.

Groundwater elevations in the A-Aquifer are also influenced by tidal fluctuations that create a sinusoidal pressure wave near the shoreline. However, tidal influence in the A-Aquifer decreases with increasing distance from the shoreline. Four tides occur daily with tidal periods being approximately six hours. At HPS, the mean tide range (calculated as the difference in height of mean high water and mean low water) is approximately 5 feet. A Tidally Influenced Zone has been defined for the A-Aquifer, where tides cause groundwater elevations to fluctuate by 0.1 foot or more. The width of the Tidally Influenced Zone varies from approximately 75 feet to 500 feet along the shoreline. The Tidal Mixing Zone is defined as the area where A-Aquifer groundwater mixes with San Francisco Bay water. The Tidal Mixing Zone is assumed to be narrower than the Tidally Influenced Zone, but has not been fully delineated.

Local anomalies in groundwater elevation can be caused by the interaction of subsurface utilities (i.e., sanitary sewer, storm sewer, and water supply lines) with the regional groundwater regime. Backfill material located along the subsurface utilities can serve as preferential pathways for groundwater flow, when submerged below the water table. Depending on location and depth, the backfill materials can either discharge or receive groundwater.

B-Aquifer

In Parcel C, groundwater elevations in monitoring wells in the semi-confined B-Aquifer can be up to several feet higher than in nearby A-Aquifer monitoring wells. The Bay Mud Aquitard thins and becomes discontinuous in the northeast portion of Parcel C, and the difference in groundwater elevations between the two aquifers is less distinct.

2.4 Summary of Previous Investigations and Remedial Actions

The following is a summary of information provided in the Feasibility Study (FS) Report for Parcel C (SuTech, 2008). A list of historical investigations in Parcel C is provided in Table 2-3 of that report. Prior soil investigations in Parcel C have reported concentrations of metals, volatile organic compounds (VOCs), TPH, polycyclic aromatic hydrocarbons (PAHs), and PCBs. Additionally, evidence of low-level radioactivity has been detected as described in the Historical Radiological Assessment (Navy, 2004).

In 1984, environmental investigations began as part of the Preliminary Assessment in the area later designated as Parcel C. These investigations included record searches, on-line surveys, interviews, and limited field investigations.

Further investigations were performed as part of the Site Inspection in 1994. These investigations included geophysical surveys of suspected subsurface fuel lines; collection of soil and groundwater samples from boreholes; installation of monitoring wells and collection of groundwater samples; collection of shallow soil samples; trenching, mapping, inspection, and sample collection from the steam lines and sanitary sewers; video surveys of the sanitary sewers; and sump and floor scrape sampling.

As part of the Remedial Investigation between 1993 and 1997, environmental investigations were performed to further assess site conditions. These environmental investigations included literature searches; interviews with former on-site employees; geophysical, radiological, and aerial map surveys; installation of soil boreholes and monitoring wells; aquifer testing; indoor air testing; and storm drain inspection.

In 2002, a Groundwater Data Gaps Investigation was performed in Parcel C. The investigation included installing monitoring wells; collecting groundwater samples from both new and existing monitoring wells; measuring groundwater levels in monitoring wells; aquifer testing; and tidal influence and mixing studies.

Past remedial actions implemented at Parcel C are listed in Table 2-4 and described in the text of the FS Report for Parcel C (SulTech, 2008).

This data gaps investigation is a result of a data need that was identified after the Navy conducted a comprehensive evaluation of soil chemical analysis data in the vicinity of existing buildings at Parcel C in 2009. This evaluation was conducted to address BCT concerns that COCs may not be adequately characterized beneath the buildings at Parcel C. The comprehensive review included evaluating database and geographical information system (GIS) information of removed and non-removed soil analytical results for all COCs within a 40-foot buffer of the buildings, including the footprint of the buildings, to a depth of 10 feet below ground surface. The evaluation was conducted as a step-wise screening process as shown in Figure 7. Soil analytical results were compared to the applicable remedial goals identified for the redevelopment block associated with the building. For buildings where at least one COC exceeded the applicable remediation goal by a factor of two or more, the building was retained for further detailed evaluation. Initially, a total of 12 buildings (Buildings 134, 203, 217, 231E, 231W, 241, 251, 253, 258, 272, 275 and 281) were retained for detailed evaluation. Building 214 was later added, for a total of 13 buildings which were evaluated in detail. The evaluation entailed spatial evaluation of soil analytical results within each building and in the perimeter of the building, to assess if soil contamination was adequately bounded beneath the building footprint. Based on the detailed evaluation, the Navy recommended additional soil sampling within the footprint of Buildings 134, 203, 214 and the eastern portion of Building 231.

A meeting was held on May 27, 2009 between the Navy, USEPA, California Department of Toxic Substances Control (DTSC), California Regional Water Quality Control Board, San Francisco Bay Region (Water Board), and City and County of San Francisco in Oakland, California to discuss the evaluation data set for the initial 12 buildings and the Navy's recommendation for additional data gap sampling within three of the buildings. After this meeting, the Navy also evaluated the footprint of Buildings 211 and 214 based on comments received on May 27, 2009. The following agreements were reached as a result of this meeting:

- The Navy will conduct a soil data gap investigation beneath Buildings 134, 203, 214 and eastern portion of Building 231 to include the following:
 - Two soil borings within Building 134, to collect soil samples for copper and PAHs

- Eight soil borings within Building 203, to collect soil samples for copper, lead, manganese, mercury, organic lead, naphthalene, PAHs, Aroclor-1260, TPH and benzene, toluene, ethylbenzene and xylenes (BTEX)
- One soil boring within Building 214, to collect soil samples for lead and PAHs
- Three soil borings within the eastern portion of Building 231, to collect soil samples for lead and PAHs.
- While the building foundations serve as an adequate soil cover remedy throughout Parcel C, the footprint of Buildings 134, 272 and 281, and the western portion of Building 231 are designated as areas requiring institutional controls (ARICs) where further action such as additional investigation and/or remedy will be required if the foundation is to be removed or modified in the future. The footprint of Buildings 203, 214 and 231 may also be designated as ARICs depending on the results of the soil data gap investigation.
- The Navy agreed to conduct a soil investigation to address the data gap prior to issuing the draft record of decision. The Navy will develop a sampling and analysis plan for agency review and approval.

Subsequent to this meeting, supplementary COCs were added to the scope of work for the data gap investigation to provide additional data for the TPH CAP. The final scope of work is depicted in the matrix in Section 1.1. Further information is provided in Appendix B.

This page intentionally left blank.

3. Regulatory Framework

This section presents the project regulatory framework.

3.1 Principal Decision Makers

Ongoing base closure work at HPS is overseen by the Navy's BRAC Program Management Office West, in San Diego, California. As the lead agency under Executive Order 12580, the Navy has authority over evaluation of risk, remedy selection, and overall public participation at HPS. USEPA co-selects the remedy. The Navy is coordinating with the USEPA, DTSC, and Water Board. The Navy, USEPA, DTSC, and Water Board representatives are collectively referred to as the BRAC Cleanup Team for HPS.

3.2 Technical or Regulatory Standards

This data investigation was being conducted under the auspices of a Federal Facilities Agreement that provides a procedural framework and schedule for the CERCLA cleanup process at HPS. Activities were performed in accordance with CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan.

3.3 Permitting Requirements

In accordance with Section 121(e) of CERCLA 1980 (CERCLA, 42 United States Code, Section 9621[e]), as amended, which states that no federal, state, or local permits shall be required for the portion of any removal or remedial action conducted entirely onsite, the work activities conducted did not require permits. Although formal permits were not required, substantive compliance with applicable requirements was met.

This page intentionally left blank.

4. Soil Sampling

The objective of this investigation was to further investigate and document the need for further remedial action under certain buildings on Parcel C if the building foundation is removed. Contaminants of concern include copper, PAHs and selected semivolatile organic compounds (SVOCs), naphthalene, manganese, mercury, organic lead, Aroclor 1260, lead, TPH-purgeable (TPH-P), TPH-extractable (TPH-E), and BTEX.

The technical approach, including sampling design and procedures, is presented in detail in Worksheet #17 of the Final SAP. In summary, field work activities consisted of the following:

- Mobilization
- Site reconnaissance to assess the current condition of the areas to be investigated
- Air monitoring during sampling using a photoionization detector (PID) for detection of hazardous and toxic vapors
- Soil borehole advancement and soil sampling using hand tools and DPT
- Sampling of investigation-derived waste (IDW)
- Laboratory analysis of soil, solid waste, and water samples
- Demobilization

The Navy issued the Final Work Plan and Sampling and Analysis Plan for the data gap investigation in December 2009 (KCH, 2009b; 2009c). The field work was completed in January and February 2010.

4.1 Preparatory Activities

Prior to beginning field work, the following preparatory activities took place:

- The Navy Remedial Project Manager (RPM), Resident Officer in Charge of Construction (ROICC), and the appropriate HPS security and fire department personnel were notified regarding the anticipated work.
- Sampling personnel reviewed the appropriate sections of the Final SAP attached to the Work Plan and signed the project sign-off sheet.
- Affected personnel read the Accident Prevention Plan and associated Site-Specific Safety and Health Plan and signed an acknowledgement form. They also attended the required HPS Radiation Awareness Training conducted by Tetra Tech EC before the field activities commenced.
- Underground Service Alert was notified at least two full working days in advance of any excavation/drilling/coring activity. Additionally, the investigation area was

geophysically surveyed to identify potential obstructions or utilities at borehole locations and borehole locations were modified as necessary.

- Mobilization activities included site preparation, movement of equipment and materials to the site, and orientation of field personnel. Upon receipt of appropriate authorizations, site personnel mobilized to the site.

Concrete slabs were cored (12-inch diameter) with mechanical equipment, as necessary, to provide access to underlying soils. Coring was conducted at proposed sampling locations. Non-native baserock underlying the concrete was removed, as necessary, before advancing boreholes.

4.2 Soil Boreholes and Sampling

A total of 46 regular samples and 30 field quality control (QC) samples were collected and submitted for analysis to Agriculture and Priority Pollutants Laboratory, Inc. (APPL), located in Clovis, California. APPL is accredited by the Department of Defense (DOD) Environmental Laboratory Accreditation Program (ELAP), the National Laboratory Accreditation Program (NELAP), and the California Department of Health Services (DHS) ELAP to perform the analyses. APPL subcontracted the organic lead samples collected during the initial phase of sampling for analysis to EMAX Laboratories, Inc. (EMAX) of Torrance, California. EMAX is approved by the Naval Facilities Engineering Service Center (NFESC) and the California DHS ELAP to perform the organic lead analysis.

4.2.1 Initial Boreholes

Between January 6 and 12, 2010, fourteen (14) initial boreholes were advanced at locations shown in Figure 3 through Figure 6 in accordance with the procedures detailed in the Final SAP. Thirteen (13) boreholes were advanced within buildings 134, 203, and 231E collectively. Prior to advancing boreholes, concrete was cored at the 13 sample locations with a concrete coring machine. A stainless steel hand or mechanical auger (approximately 3-inch diameter) was used to remove soils overlying the sampling interval. Once the top of the soil sampling interval was reached, soil samples were collected with a manually operated slide hammer that advanced 2-inch-diameter by 6-inch-long stainless steel sampling sleeves into undisturbed soil. The slide hammer sampling assembly was then removed from the borehole, and the stainless steel sampling sleeve was removed from the assembly. Each end of the sampling sleeve was sealed with Teflon™ tape, then sealed with non-reactive plastic caps. Operation of the auger and slide hammer was in accordance with the manufacturers' operating instructions.

For soil samples analyzed for VOCs and purgeable TPH, a composite polymer sampling device (e.g., EnCore® or equivalent) was used to collect the final soil sample from the sampling sleeve. These small diameter, airtight sampling (coring) devices minimize the loss of volatile constituents from the sample after the sample is collected (i.e., the seal of the vial is never broken between the time the sample is collected and analyzed). The outer one inch of soil from each of the two ends of the sampling sleeve was removed. One 5-gram capacity EnCore® sampling vial was advanced into the underlying soil in one end of the sleeve, and two vials were advanced into the other end of the sleeve (generating three separate 5-gram

aliquots of soil from each sleeve). The three EnCore® sampling vials were withdrawn, hermetically sealed, and placed in a labeled plastic bag.

After each sample was collected, the sample containers were immediately labeled and placed in the cooler, and maintained at a temperature of approximately 6° Celsius (°C) or below. Sample containers were individually labeled, stored, and transported to the analytical laboratory consistent with chain-of-custody procedure in accordance with the Final SAP. Sample custody was maintained and custody transfer was documented from the time of sample collection through sample disposal by the laboratory.

Soil samples were collected between depths of approximately 0.5 feet and 10 feet below ground surface (BGS) (drilling penetration and groundwater depth permitting), with the number of samples and sample depths varying by borehole. Borehole-specific sampling depths were based on Worksheet #18-A of the Final SAP.

Nine of the initial fourteen boreholes encountered refusal above the proposed total depth. Refusal was caused by boulders and cobbles in the fill material, buried concrete slabs, or buried metal pipes.

One borehole was advanced adjacent to Building 214 due to limited access and unsafe conditions within the building as shown in Figure 5a. Prior to advancing the borehole, the investigation area was geophysically surveyed to identify potential obstructions or utilities. Drilling was conducted by Vironex of Pacheco, California (California C57 license #705927). The borehole was advanced using a truck-mounted hydraulic/percussion DPT rig, at an angle of 30 degrees from vertical. Continuous soil cores were collected at the boring location. The borehole was advanced over 5-foot intervals using a 1.75-inch diameter, steel sampling barrel lined with opaque acetate sleeves. Soil was pushed into the sampling sleeves as the drill string was advanced. Upon retrieval, the acetate sleeves were cut open, samples were collected for analysis, soil cores and ambient air were screened using a PID for H&S purposes, and described by the field geologist using the Unified Soil Classification System (USCS) on borehole logs. Graphical logs of boreholes are presented in Appendix C. Sample depths were measured along drilling length and were later calculated to feet BGS.

4.2.2 Step-out Boreholes

Between February 3 and 4, 2010, three additional step-out boreholes were advanced adjacent to Building 214 (locations shown in Figure 5b). Step-out locations were selected based on the decision criteria presented in Appendix B of the Final SAP (KCH, 2009c). Since the initial sampling indicated the presence of contaminants above the remedial goals, additional samples were deemed necessary. Previous analytical data in the area was assessed including the recent boring and three locations were selected as step out locations. These locations were plotted on a map and presented to the BCT for concurrence during the January 2010 BCT meeting. The BCT accepted the locations and the step out sampling was completed.

The step-out locations were advanced adjacent to Building 214 using a truck-mounted hydraulic/percussion DPT rig. Prior to advancing the borehole, the investigation area was geophysically surveyed to identify potential obstructions or utilities. Drilling was conducted by Vironex of Pacheco, California (California C57 license #705927).

Continuous soil cores were collected at three boring locations: 214-STEP-01, 214-STEP-02, and 214-STEP-03 as shown in Figure 5b. Boreholes at these locations were advanced at 5-foot intervals using a 1.75-inch-diameter, steel sampling barrel lined with opaque acetate sleeves. Soil was pushed into the sampling sleeves as the drill string was advanced. Upon retrieval, samples were collected for analysis, the remaining acetate sleeves were cut open, and soil cores were screened using a PID and described by the field geologist using the USCS on borehole logs. Graphical logs of boreholes are presented in Appendix C.

4.2.3 Deviations from Final SAP

Borehole 214-S-01 was advanced using a truck-mounted hydraulic/percussion DPT rig instead of with a truck-mounted 8-inch-diameter slant-drive auger rig per the Final SAP. This deviation was made due to contractor availability and to decrease IDW generated using auger rigs.

Step-out boreholes were advanced vertically instead of at an angle due to the presence of underground utilities. These deviations from the Final SAP did not affect the project objectives.

4.3 Field Equipment Decontamination

During sampling activities, field personnel decontaminated non-disposable/non-dedicated sampling equipment after use. Field personnel took appropriate measures to prevent contamination of clean or decontaminated equipment prior to use. Clean sampling equipment was not placed directly on the ground or known contaminated surfaces prior to use. When not in active use, decontaminated field equipment was stored in sealed polyethylene drum liners. Field personnel wore clean, disposable gloves that do not degrade when exposed to the preservatives or field chemicals. The decontamination procedure included the following steps:

- Wash with non-phosphate detergent (e.g., Liquinox™).
- Rinse with tap water.
- Final rinse with water from an approved water supply (e.g., distilled or reagent-grade water).

4.4 Borehole Decommissioning

Following sample collection activities, each borehole was grouted to within several inches of surface using slurry consisting of neat cement, bentonite powder, and potable water. The surface of each borehole location was finished with slurry of neat cement and potable water.

4.5 Investigation-Derived Waste

Soil cuttings, decontamination water, personal protective equipment, and associated waste generated during this project were stored in Department of Transportation (DOT)-approved 55-gallon drums to be screened for radiation and disposed of in accordance with HPS site

protocols. Final SAP Worksheet #17 provides details of waste disposal requirements and procedures.

The IDW is being handled in accordance with the HPS site protocols. The IDW generated during soil sampling activities included the following:

Soil: Waste soil generated during borehole advancement stored in labeled, steel DOT-approved 55-gallon drums. Waste characterization samples will be collected for the purpose of profiling the waste soil for disposal. The drums were left at the site for manifesting, transport, and disposal by another Navy contractor.

Water: Wastewater generated during decontamination of field sampling equipment was stored in labeled, steel DOT-approved 55-gallon drums. Wastewater was disposed of in accordance to HPS site protocols.

Other Solid Waste: Other solid waste generated during sampling activities included personal protective equipment (PPE) and miscellaneous trash. This waste was disposed of as non-regulated solid waste. Concrete cores (generated by coring through the building floors) were left at each work area for disposal by others.

4.6 Location Surveying

Each borehole location was surveyed by a professional land surveyor licensed by the State of California. The surveyor provided the elevation at backfilled ground surface for each borehole location to a precision of 0.01 foot and its location to a precision of plus or minus 0.1 foot horizontally, based on the borehole center. The elevations were surveyed relative to the 1988 National Geodetic Vertical Datum. The borehole locations were surveyed using the 1983 North American Datum State Plane Coordinate System, California, Zone 3.

4.7 Safety and Health

Field activities for this project were performed in accordance with the *Accident Prevention Plan for Data Gap Investigation of Soil Under Buildings on Parcel C* and associated Site-Specific Safety and Health Plan (KCH, 2009a). Radiation training and monitoring of personnel, tools, material, equipment, and IDW was conducted by Tetra Tech EC in accordance with a project-specific work instruction. This included directing requirements for site access/egress and tools, materials, equipment, storage and associated decontamination.

This page intentionally left blank.

5. Soil Analytical Results

The soil samples were analyzed by APPL and EMAX laboratories for one or more of the following:

- Copper, lead, and manganese by USEPA Method 6010C
- Mercury by USEPA Method 7471B
- PAHs by USEPA Method 8270D selected ion monitoring (SIM)
- SVOCs by USEPA Method 8270D
- Naphthalene by USEPA Method 8260B and 8270D SIM
- PCBs (Aroclor 1260) by USEPA Method 8082A
- TPH - extractable by USEPA Method 8015C
- TPH - purgeable by USEPA Method 8015C
- VOCs by USEPA Method 8260B
- BTEX by USEPA Method 8260B

Table 1 shows the analyses performed for each sample by building number. Analyses varied between samples. Tables 2 through 5 present the analytical results reported above method detection limits (MDLs) for the samples collected during this investigation. The laboratory analytical reports report TPH-purgeable as TPH gasoline. TPH-extractable is reported as (1) TPH diesel and (2) TPH motor oil. The analytical results presented on Tables 2 through 5 were compared to the Draft Parcel C ROD Remedial Goals and, where applicable, the Tier 1 TPH CAP criteria. The TPH CAP Tier 1 criteria were chosen because they represent the most conservative criteria available for the TPH CAP.

Executed chain-of-custody documents are included as Appendix D.

The hardcopy laboratory sample summary results are incorporated into the data validation report and included on the CD ROM presented in Appendix E.

5.1 Building 134

Analytical results for the four soil samples collected from Borings 134-S-01 and 134-S-02 advanced in Building 134 are described in this section. Analytical results are summarized in Figure 3.

5.1.1 Copper

Four (4) soil samples were collected for copper analysis from two boreholes at depths ranging from approximately 0.5 to 2.5 feet below the concrete slab.

Copper was reported above the laboratory quantitation limits in the four soil samples collected from Building 134. Detected results ranged from approximately 17.9 to 38.6 milligrams per kilogram (mg/kg). No copper detections were above the Draft Parcel C ROD Remedial Goal of 160 mg/kg. Location-specific concentration values for copper are presented in Table 2.

5.1.2 Methyl Tertiary Butyl Ether (MTBE)

Four (4) soil samples were collected for MTBE analysis from two boreholes at depths of approximately 0.5 and 2.5 feet below the concrete slab.

MTBE was not detected at concentrations above the MDL in the soil samples collected from Building 134.

5.1.3 Polycyclic Aromatic Hydrocarbons (PAHs) / Semivolatile Organic Compounds (SVOCs)

Four (4) soil samples were collected for PAHs / SVOCs analysis from two boreholes at depths of approximately 0.5 and 2.5 feet below the concrete slab.

Multiple PAHs / SVOCs were reported in three of the four soil samples collected from Building 134. Detected results ranges were analyte-specific. Location-specific concentration values for PAHs / SVOCs are presented in Table 2.

5.1.4 Naphthalene

Four (4) soil samples were collected for naphthalene analysis as a VOC using USEPA Method 8260B and as an SVOC using USEPA 8270D SIM from two boreholes at depths of approximately 0.5 and 2.5 feet below the concrete slab.

Naphthalene as a VOC was not detected at concentrations above the MDL in the soil samples collected from Building 134. Naphthalene as an SVOC was reported in three of the four samples collected from Building 134. Detected results for naphthalene as an SVOC ranged from approximately 0.0018 to 0.024 milligrams per kilogram (mg/kg). Location-specific concentration values for naphthalene as an SVOC are presented in Table 2. One (1) detection at 0.024 mg/kg was higher than the TPH CAP Tier 1 criterion of 0.019 mg/kg.

5.1.5 Total Petroleum Hydrocarbons (TPH) – Extractable

Four (4) soil samples were collected for TPH-E analysis from two boreholes at depths of approximately 0.5 and 2.5 feet below the concrete slab.

TPH-E (motor oil) was reported in three of the four soil samples collected from Building 134. Detected results ranged from approximately 31 to 39 mg/kg. TPH-E (diesel) was reported in three of the four soil samples collected from Building 134. Detected results ranged from approximately 12 to 82 mg/kg. Location-specific concentration values for TPH-E (motor oil) and TPH-E (diesel) are presented in Table 2. One (1) detection of TPH-E (diesel) at 82 mg/kg was higher than the TPH CAP Tier 1 criterion of 35 mg/kg.

5.1.6 Total Petroleum Hydrocarbons (TPH)– Purgeable

Four (4) soil samples were collected for TPH-P analysis from two boreholes at depths ranging from approximately 0.5 to 2.5 feet below the concrete slab.

TPH-P was not detected at concentrations above the MDL in the soil samples collected from Building 134.

5.1.7 Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)

Four (4) soil samples were collected for BTEX analysis from two boreholes at depths of approximately 0.5 and 2.5 feet below the concrete slab.

BTEX were not detected at concentrations above the MDLs in the soil samples collected from Building 134.

5.2 Building 203

Analytical results for the fifteen (15) soil samples collected from Borings 203-S-01 through 203-S-08 advanced in Building 203 are described in this section. Analytical results are summarized in Figure 4.

5.2.1 Naphthalene

Seven (7) soil samples were collected for naphthalene analysis as a VOC using USEPA Method 8260B from three boreholes at depths ranging from approximately 0.5 to 4.5 feet below the concrete slab. Eight (8) soil samples were collected for naphthalene analysis as an SVOC using EPA Method 8270D SIM from four boreholes at depths ranging from approximately 0.5 to 4.5 feet below the concrete slab.

Naphthalene as a VOC was not detected at concentrations above the MDLs in the soil samples collected from Building 203. Naphthalene as an SVOC was reported in six of the eight soil samples collected from Building 203. Detected results for naphthalene as an SVOC ranged from approximately 0.0018 to 0.016 mg/kg. However, no naphthalene detections were above the Draft Parcel C ROD Remedial Goals. Location-specific concentration values for naphthalene as an SVOC are presented in Table 3.

5.2.2 Polycyclic Aromatic Hydrocarbons (PAHs) / Semivolatile Organic Compounds (SVOCs)

Eight (8) soil samples were collected for PAHs /SVOCs analysis using EPA Method 8270 D SIM from four boreholes at depths ranging from approximately 0.5 to 4.5 feet below the concrete slab.

Multiple PAHs/SVOCs were reported above the laboratory quantitation limits in seven (7) of the eight soil samples collected from Building 203. Detected results ranges were analyte-specific. No PAHs/ SVOC detections were above Draft Parcel C ROD Remedial Goals or TPH CAP Tier 1 criteria. Location-specific concentration values for PAHs/SVOCs are presented in Table 3.

5.2.3 Copper

Nine (9) soil samples were collected for copper analysis from eight boreholes at depths ranging from approximately 0.5 to 4.5 feet below the concrete slab.

Copper was reported above the laboratory quantitation limit in five (5) of the nine soil samples collected from Building 203. Detected results ranged from approximately 9.8 to 40.4 mg/kg. No copper detections were above the Draft Parcel C ROD Remedial Goal of 160 mg/kg. Location-specific concentration values for copper are presented in Table 3.

5.2.4 Lead

Two (2) soil samples were collected for lead analysis from Boring 203-S-05 at depths ranging from approximately 0.5 to 2.5 feet below the concrete slab.

Lead was reported above the laboratory quantitation limit in the two soil samples collected from Building 203. Detected results ranged from 2.9 to approximately 6.1 mg/kg. No lead detections were above the Draft Parcel C ROD Remedial Goal of 155 mg/kg. Location-specific concentration values for lead are presented in Table 3.

5.2.5 Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)

Two (2) soil samples were collected for BTEX analysis from Boring 203-S-06 at depths ranging from approximately 0.5 to 2.5 feet below the concrete slab.

BTEX were not detected at concentrations above the MDLs in the soil samples collected from Building 203.

5.2.6 Manganese

Four (4) soil samples were collected for manganese analysis from Borings 203-S-02, 203-S-05, and 203-S-08 at depths ranging from approximately 0.5 to 2.5 feet below the concrete slab.

Manganese was reported above the laboratory quantitation limits in the four soil samples collected from Building 203. Detected results ranged from approximately 309 to 1,380 mg/kg. No manganese detections were above the Draft Parcel C ROD Remedial Goal of 1,431 mg/kg. Location-specific concentration values for manganese are presented in Table 3.

5.2.7 Mercury

One (1) soil sample was collected for mercury analysis from Boring 203-S-02 at a depth of approximately 0.5 feet below the concrete slab.

Mercury was reported above the laboratory quantitation limits in the soil sample collected from Building 203 at a concentration of 0.22 mg/kg. This mercury detection was below the Draft Parcel C ROD Remedial Goal of 2.28 mg/kg. Location-specific concentration values for mercury are presented in Table 3.

5.2.8 Polychlorinated Biphenyls (PCBs) (Aroclor 1260)

Six (6) soil samples were collected for Aroclor 1260 analysis from Borings 203-S-03, 203-S-05, and 203-S-07 at depths ranging from approximately 0.5 to 4.5 feet below the concrete slab.

Aroclor 1260 was reported above the laboratory quantitation limits in two (2) of the six soil samples collected from Building 203. Detected results ranged from approximately 0.12 to 0.52 mg/kg. No Aroclor 1260 detections were above the Draft Parcel C ROD Remedial Goal of 0.21 mg/kg. Location-specific concentration values for PCBs are presented in Table 3.

5.2.9 Total Petroleum Hydrocarbons (TPH) – Extractable

Two (2) soil samples were collected for TPH-E analysis from Boring 203-S-06 at depths ranging from approximately 0.5 to 2.5 feet below the concrete slab.

TPH-E diesel was reported above the laboratory quantitation limit in one (1) of the two soil samples collected from Building 203 at a concentration of approximately 9.1 mg/kg. TPH-E motor oil was reported above the laboratory quantitation limit in one (1) of the two soil samples collected from Building 203 at a concentration of approximately 26 mg/kg. No detections were above the TPH CAP Tier 1 criteria. Location-specific concentration values for TPH-E are presented in Table 3.

5.2.10 Organic Lead

Eight (8) soil samples were collected for organic lead analysis from Borings 203-S-03, 203-s-04, and 203-S-06 at depths ranging from approximately 0.5 to 4.5 feet below the concrete slab.

Organic lead was reported above the laboratory quantitation limit in two (2) of the eight soil samples collected from Building 203. Detected results ranged from approximately 0.00908 to 0.198 mg/kg. No organic lead detections were above the Draft Parcel C ROD Remedial Goal of 0.5 mg/kg. Location-specific concentration values for organic lead are presented in Table 3.

5.3 Building 214

Analytical results for the six (6) soil samples collected from Boring 214-S-01 advanced adjacent to Building 214 are described in this section. Analytical results are summarized in Figure 5a.

5.3.1 Lead

Six (6) soil samples were collected for lead analysis from one borehole at depths ranging from approximately 0.4 to 8.2 feet below the aggregate base.

Lead was reported above the laboratory quantitation limit in five (5) of the six soil samples collected from Building 214. Detected results ranged from approximately 16.9 to 356 mg/kg. One (1) lead detection was above the Draft Parcel C ROD Remedial Goal of 155 mg/kg. Location-specific concentration values for lead are presented in Table 4.

5.3.2 Polycyclic Aromatic Hydrocarbons (PAHs) / Semivolatile Organic Compounds (SVOCs)

Six (6) soil samples were collected for PAHs/SVOCs analysis from one borehole at depths ranging from approximately 0.4 to 8.2 feet below the aggregate base.

Multiple PAHs / SVOCs were reported above the laboratory quantitation limits in the six soil samples collected from Building 214. The ranges of the detected values were analyte-specific. Twenty-two (22) detections were either above the Draft Parcel C ROD Remedial Goals or TPH CAP Tier 1 criteria. Location-specific concentration values for PAHs /SVOCs are presented in Table 4.

5.4 Building 214 Step-out

Analytical results for the eighteen (18) soil samples collected from Borings 214-STEP-01 through 214-STEP-03 advanced adjacent to Building 214 are described in this section. Analytical results are summarized in Figure 5b.

5.4.1 Lead

Eighteen (18) soil samples were collected for lead analysis from the three step out boreholes at depths ranging from approximately 0.5 to 9.5 feet below the aggregate base.

Lead was reported above the laboratory quantitation limit in the 18 soil samples collected from Building 214. Detected results ranged from approximately 5.8 to 123.0 mg/kg. No lead detections in Building 214 step-out samples were above the Draft Parcel C ROD Remedial Goal of 155 mg/kg. Location-specific concentration values for lead are presented in Table 4.

5.4.2 Polycyclic Aromatic Hydrocarbons (PAHs) / Semivolatile Organic Compounds (SVOCs)

Eighteen (18) soil samples were collected for PAHs/SVOCs analysis from the three step out boreholes at depths ranging from approximately 0.5 to 9.5 feet below the aggregate base.

Multiple PAHs / SVOCs were reported above the laboratory quantitation limits in the eighteen step out soil samples collected from Building 214. The ranges of detected values were analyte-specific. Six (6) step out sample detections were above either the Draft Parcel C ROD Remedial Goals or TPH CAP Tier 1 criteria. Location-specific concentration values for PAHs /SVOCs are presented in Table 4.

5.5 Building 231E

Analytical results for the three (3) soil samples collected from Borings 231E-S-01 and 231E-S-02 advanced in Building 231E are described in this section. Analytical results are summarized in Figure 6.

5.5.1 Lead

Three (3) soil samples were collected for lead analysis from two boreholes at depths ranging from approximately 0.5 to 2.5 feet below the concrete slab.

Lead was reported above the laboratory quantitation limit in the three soil samples collected from Building 231E. Detected results ranged from approximately 1.9 to 274 mg/kg. One (1) lead detection was above the Draft Parcel C ROD Remedial Goal of 155 mg/kg. Location-specific concentration values for lead are presented in Table 5.

5.5.2 Methyl Tertiary Butyl Ether (MTBE)

One (1) soil sample was collected for MTBE analysis from Boring 231E-S-02 at a depth of approximately 0.5 feet below the concrete slab.

MTBE was not detected at concentrations above the MDL in the soil sample collected from Building 231E.

5.5.3 Polycyclic Aromatic Hydrocarbons (PAHs) / Semivolatile Organic Compounds (SVOCs)

One (1) soil sample was collected for PAHs/SVOCs analysis from a borehole at a depth of approximately 0.5 feet below the concrete slab.

Multiple PAHs / SVOCs were reported above the laboratory quantitation limits in the soil sample collected from Building 231E. The ranges of detected values were analyte-specific. One (1) detection was above the TPH CAP Tier 1 criteria. Location-specific concentration values for PAHs/SVOCs are presented in Table 5.

5.5.4 Total Petroleum Hydrocarbons (TPH) – Extractable

One (1) soil sample was collected for TPH-E analysis from Boring 231E-S-02 at a depth of approximately 0.5 feet below the concrete slab.

TPH-E diesel was reported above the laboratory quantitation limit in the soil sample collected from Building 231E at a concentration of approximately 7.0 mg/kg. TPH-E motor oil was reported above the laboratory quantitation limit in the soil sample collected from Building 231E at a concentration of 20 mg/kg. No detections were above the TPH CAP Tier 1 criteria. Location-specific concentration values for TPH-E are presented in Table 5.

5.5.5 Total Petroleum Hydrocarbons (TPH) – Purgeable

One (1) soil sample was collected for TPH-P analysis from Boring 231E-S-02 at a depth of approximately 0.5 feet below the concrete slab.

TPH-P was not detected at concentrations above the MDL in the soil sample collected from Building 231E.

5.5.6 Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)

One (1) soil sample was collected for BTEX analysis from Boring 231E-S-02 at a depth of approximately 0.5 feet below the concrete slab.

Benzene was reported in the soil sample collected from Building 231E at a concentration of 0.00095 mg/kg. The Benzene detection was below the Draft Parcel C ROD Remedial Goal or TPH CAP Tier 1 criterion of 0.18 mg/kg or 0.0049 mg/kg, respectively. Toluene, ethylbenzene, and xylenes were not detected at concentrations above the MDLs in the soil sample collected from Building 231E. Location-specific concentration values for detected constituents are presented in Table 5.

This page intentionally left blank.

6. Data Quality, Verification, and Validation

6.1 Quality Control Samples

Field and laboratory QC samples were collected in the field and laboratory to evaluate and monitor the quality of both the field and laboratory procedures. Field QC samples consisted of the following types:

- Trip blank samples
- Equipment rinsate blank samples (rinsates)
- Source water samples
- Excess sample volume for matrix spike/matrix spike duplicate (MS/MSD) samples
- Temperature blank samples

Table 6 presents the field QC analytical results.

Upon laboratory sample receipt, the laboratory measured the cooler temperatures using temperature blanks. The laboratory did not report temperatures exceeding 6°C in the sample coolers submitted for this investigation.

During the data quality assessment (DQA), organic and inorganic contaminants reported in samples with less than five times the concentrations detected in blanks (or 10 times for common laboratory contaminants) were qualified as not detected and assigned a "U" qualifier. A low percentage of the overall sample results (approximately 0.4 percent) were affected by potential laboratory or field contamination, increasing some of the quantitation limits for these analytes.

Contaminants reported in field samples with less than five times the concentrations detected in field blanks were qualified as not detected and assigned a "U" qualifier. No analytes were reported above method detection limits in any trip blank samples. Elevated concentrations of copper were reported in three rinsate samples, affecting the quantitation limits for copper in associated field samples. Five associated field samples were qualified as non-detected (approximately 0.4 percent of the data) due to the likelihood of field contamination. With the exception of these five sample results, the overall data quality was deemed unaffected and thus unqualified during the data validation process, since the analytes were either not detected in the associated field samples or were detected at above 5 times the concentration in the rinsate samples.

6.2 Data Quality Assessment

The DQA process consists of a systematic review, verification, validation, and usability assessment of the data generated for this investigation. The purpose of the DQA is to evaluate and monitor the performance of the field sampling and analytical procedures and assess the quality of the data. Data review and verification were performed by the Project Chemist on 100 percent of the analytical data. Environmental Data Validation, Inc. (EDV),

located in Pittsburgh, Pennsylvania, was selected to perform the independent, third-party data validation. The data were reviewed, verified and validated consistent with the procedures presented in the following documents:

- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, 2008)
- *USEPA Contract Laboratory National Functional Guidelines for Inorganic Data Review* (USEPA, 2004).
- *USEPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Third Edition. Updates I, II, IIA, IIB, III, IIIA, IIIB, and IV* (USEPA, 2007).
- *Final Sampling and Analysis Plan* (KCH, 2009c).
- *Naval Facilities Engineering Command (NAVFAC) Southwest Environmental Work Instruction Number 1: Chemical Data Validation* (Navy, 2001).

Data validation was performed on 100 percent of the data. Approximately 100 percent of the data were validated at level III and 20 percent were validated at level IV in accordance with the Final SAP and the NAVFAC Southwest Environmental Work Instruction Number 1 (Navy, 2001).

A total of 1,437 analytical results were evaluated by EDV during the data validation process.

The data validation reports, which include the hardcopy sample summary results of qualified and unqualified data, are provided on CD ROM in Appendix E.

As a result of the data validation process, some analytical results were qualified as estimated (i.e., "J" qualified), or estimated at an elevated quantitation limit (i.e., "UJ" qualified). However, these results qualified as estimated are still considered usable. Results were qualified as estimated for one or more of the following reasons:

- Field blank contamination;
- Serial dilution criteria exceeded;
- Surrogates, MS, or MSD samples percent recoveries outside the acceptable criteria; or
- Calibration with percent differences outside the acceptable criteria.

Results qualified as estimated ("J" or "UJ" flagged) are still considered usable.

The data quality indicators, otherwise known as precision, accuracy, representativeness, comparability, completeness, and sensitivity (PARCCS), were evaluated in accordance with the PARCCS parameters defined in the Final SAP. The PARCCS parameters were met for the data gap investigation, and were assessed as follows:

- **Precision** was assessed by evaluating the relative percent differences (RPDs) of the MS/MSD samples and laboratory sample duplicates for each applicable analytical method. The low percentage (less than 0.1 percent) of precision exceedances indicates that the analytical methods were consistently precise.
- **Accuracy** was assessed by evaluating percent recoveries of MS samples, laboratory control sample (LCS), and surrogate recoveries for each applicable analytical method. A

low percentage of sample results (approximately 1.3 percent) were qualified due to MS, internal standard, or surrogate recoveries, indicating that the methods were consistently accurate.

- **Representativeness** was assessed by the use of established field and laboratory procedures, and their consistent application. Representativeness was maintained by using standard operating procedures (SOPs), including chain-of-custody protocol and documentation, soil sampling, sample labeling, sample packaging and transport, as well as maintaining good condition of the samples upon receipt at the laboratory.
- **Comparability** was assessed by evaluating the use of well-documented analytical methods and SOPs, standard reference materials, QC samples, and reporting each data type in consistent units. The use of USEPA analytical methods, specified and well-documented analyses, California State-accredited and DOD ELAP- or NFESC-accredited laboratories, and a standardized data quality assessment process gives the data a high degree of analytical comparability.
- **Completeness** was assessed by evaluating the validity of data obtained as a result of the data quality assessment process (i.e., amount of valid data obtained as compared to the amount that was expected to be obtained under normal conditions). Estimated data ("J" or "UJ" qualified) are considered valid and usable; however, rejected data ("R" qualified) and missing analyses are considered unusable and incomplete. Several PAH results were reported at elevated concentrations exceeding the calibration range and as dilutions. In these six instances where more than one result was reported for a compound (i.e., original analysis and dilution), the most technically acceptable result was reported and the other one was rejected. A result that is rejected due to the availability of another more technically acceptable result is not considered within the completeness calculation. One naphthalene result was rejected due to poor internal standard response. Of the 1,431 analytical results considered in the completeness calculation, 99.9 percent are considered usable, which meets the completeness goal of 90 percent defined in the Final SAP.
- **Sensitivity** was assessed by evaluating the use of project quantitation limits. In general, project quantitation limits were low enough to satisfy the action levels being applied and used to evaluate the project data.

As a result of the DQA process, it has been concluded that the data quality indicators (i.e., PARCCS) either met or exceeded the parameters, as defined in the Final SAP for the analytical data generated by the data gap investigation.

This page intentionally left blank.

7. Recommendations

7.1 Building 134

Contaminants of concern were not detected in soil samples collected from under Building 134 at concentrations exceeding Parcel C remedial goals for soil. No further action is recommended for the locations investigated. TPH CAP recommendations are not included as part of this scope of work.

7.2 Building 203

Contaminants of concern were not detected in soil samples collected from under Building 203 at concentrations exceeding Parcel C remedial goals or TPH CAP Tier 1 criteria for soil. No further action is recommended for the locations investigated. TPH CAP recommendations are not included as part of this scope of work.

7.3 Building 214

Contaminants of concern were detected in soil samples collected from two of the four borings advanced under and adjacent to Building 214 at concentrations that exceeded the Parcel C remedial goals and CAP Tier 1 criteria for soil. Remediation of the underlying soils at these two locations to levels consistent with other remedial actions in Parcel C is recommended if the building is demolished and the foundation removed.

7.4 Building 231E

Contaminants of concern were detected in soil samples collected from one of three borings advanced under Building 231E at concentrations that exceeded the Parcel C remedial goals for soil. TPH CAP recommendations are not included as part of this scope of work.

This page intentionally left blank.

8. References

- American National Standards Institute (ANSI). 2004. "ANSI/ASQ E4-2004: Quality Systems for Environmental Data and Technology Programs: Requirements with Guidance for Use." Online: <http://webstore.ansi.org/RecordDetail.aspx?sku=ANSI%2FASQ+E4-2004>
- ChaduxTt. 2010. *Draft Record of Decision for Parcel C, Hunters Point Shipyard, San Francisco, California*. April.
- CE2 Corporation. 2005. *Final Work Plan for Contamination Delineation at Remedial Unit C5*. November.
- CH2M HILL Kleinfelder (KCH). 2009a. *Accident and Prevention Plan for Data Gap Investigation for Soil Under Buildings on Parcel C- Hunters Point Shipyard, San Francisco, California*. August.
- CH2M HILL Kleinfelder (KCH). 2009b. *Final Work Plan Data Gap Investigation of Soil Under Buildings on Parcel C, Hunters Point Shipyard, San Francisco, California*. December.
- CH2M HILL Kleinfelder (KCH). 2009c. *Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) for Data Gaps Investigation of Soil Under Buildings on Parcel C*. December.
- Shaw Environmental Inc. 2007. *Final New Preliminary Screening Criteria and Petroleum Program Strategy, Hunters Point Shipyard, San Francisco, California*, December 21.
- State of California. 1989. *Leaking Underground Fuel Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure*. DHS LUFT Task Force. October.
- SulTech. 2008. *Final Feasibility Study Report for Parcel C, Hunters Point Shipyard, San Francisco, California*, July 31.
- United States Environmental Protection Agency (USEPA). 2001. *EPA Requirements for Quality Assurance Project Plans*. EPA QA/R-5, EPA/240/B-01/003. March.
- United States Environmental Protection Agency (USEPA). 2004. *USEPA Contract Laboratory National Functional Guidelines for Inorganic Data Review*. EPA 540-R-04-004.
- United States Environmental Protection Agency (USEPA). 2004. *USEPA Contract Laboratory Program National Functional Guidelines for Total Data Review*. EPA 540-R-04-004. October.
- United States Environmental Protection Agency (USEPA). 2005. *Uniform Federal Policy for Quality Assurance Project Plans: Evaluating, Assessing, and Documenting Environmental Data Collection and Use Programs*. Intergovernmental Data Quality Task Force with the Department of Defense and the Department of Energy. EPA pub. no. EPA-505-B-04-900A; DOD pub. No. DTIC ADA427785. Online: http://www.epa.gov/fedfac/pdf/ufp_qapp_v1_0305.pdf. March.

United States Environmental Protection Agency (USEPA). 2007. *USEPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Third Edition. Updates I, II, IIA, IIB, III, IIIA, IIIB, and IV.*

United States Environmental Protection Agency (USEPA). 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review.* EPA 540-R-99-008. June.

United States Department of the Navy (Navy). 2001. *Environmental Work Instruction No. 1: Chemical Data Validation, Naval Facilities Engineering Command Southwest.* San Diego, California. November 28.

United States Department of the Navy (Navy). 2004. *Historical Radiological Assessment, Volume II, Use of General Radioactive Materials, 1939-2003, Hunters Point Shipyard, San Francisco, California.* Radiological Affairs Support Office (RASO). August 31.

United States Department of the Navy (Navy). 2007. *Internal Draft Record of Decision for Parcel C, Hunters Point Shipyard, San Francisco, California.* March 9.

United States Department of the Navy (Navy). 2009a. *Internal Draft Record of Decision for Parcel C Hunters Point Shipyard, San Francisco, California.* Base Realignment and Closure Program Management Office West. March.

United States Department of the Navy (Navy). 2009b. *Contract N62473-09-D-2622, PTO X003, Scope of Work, Remedial Design for Parcel C, Data Investigation for Parcel C, Hunters Point Shipyard, San Francisco.* California. June 22.

Tables

This page intentionally left blank.

TABLE 1
Sample Summary for Soil and Field Quality Control Samples

Building	Borehole ID	Sample Depth ¹	Sample ID	Sample Date	Sample Type	Copper	Lead	Mang	Organic Lead	Mercury	TPH gasoline	TPH diesel	TPH motor oil	Aroclor-1260	BTEX	MTBE	Naph	SVOCs / PAHs
Analytical Method ²						EPA 6010C			HML 939M ³	EPA 7471B / 7470A ⁴	EPA 8015C			EPA 8082	EPA 8260B			EPA 8270D / 8270D SIM
134	134-S-01	0.5	1002W002	01/05/2010	N	X					X	X	X		X	X	X	X
134	134-S-01	2.5	1002W005	01/06/2010	N	X					X	X	X		X	X	X	X
134	134-S-02	0.5	1002W006	01/06/2010	N	X					X	X	X		X	X	X	X
134	134-S-02	2.5	1002W009	01/07/2010	N	X					X	X	X		X	X	X	X
203	203-S-01	0.5	1002N002	01/05/2010	N												X	X
203	203-S-01	2.5	1002N003	01/05/2010	N												X	X
203	203-S-02	0.5	1002N004	01/05/2010	N	X		X		X								X
203	203-S-03	0.5	1002N007	01/06/2010	N	X			X					X				
203	203-S-03	2.5	1002N008	01/06/2010	N	X			X					X				
203	203-S-03	4.5	1002N009	01/06/2010	N	X			X					X				
203	203-S-04	0.5	1002N010	01/06/2010	N	X			X								X	X
203	203-S-04	2.5	1002N011	01/06/2010	N	X			X								X	X
203	203-S-04	4.5	1002N014	01/07/2010	N	X			X								X	X
203	203-S-05	0.5	1002D002	01/08/2010	N	X	X	X						X				
203	203-S-05	2.5	1002D003	01/08/2010	N	X	X	X						X				
203	203-S-06	0.5	1002N024	01/08/2010	N				X			X	X		X		X	X
203	203-S-06	2.5	1002N025	01/08/2010	N				X			X	X		X		X	X
203	203-S-07	0.5	1002D004	01/08/2010	N									X				
203	203-S-08	0.5	1002D005	01/08/2010	N			X										
214	214-S-01	0.4	1002N015	01/07/2010	N		X											X
214	214-S-01	2.2	1002N016	01/07/2010	N		X											X
214	214-S-01	3.9	1002N017	01/07/2010	N		X											X
214	214-S-01	5.6	1002N018	01/07/2010	N		X											X
214	214-S-01	7.4	1002N019	01/07/2010	N		X											X
214	214-S-01	8.2	1002N020	01/07/2010	N		X											X
214	214-STEP-01	0.5	1006N027	02/03/2010	N		X											X
214	214-STEP-01	2.5	1006N028	02/03/2010	N		X											X
214	214-STEP-01	4.5	1006N029	02/03/2010	N		X											X
214	214-STEP-01	6.5	1006N030	02/03/2010	N		X											X
214	214-STEP-01	8.5	1006N031	02/03/2010	N		X											X
214	214-STEP-01	9.5	1006N032	02/03/2010	N		X											X
214	214-STEP-02	0.5	1006N033	02/03/2010	N		X											X
214	214-STEP-02	2.5	1006N034	02/03/2010	N		X											X
214	214-STEP-02	4.5	1006N035	02/03/2010	N		X											X
214	214-STEP-02	6.5	1006N036	02/03/2010	N		X											X
214	214-STEP-02	8.5	1006N037	02/03/2010	N		X											X
214	214-STEP-02	9.5	1006N038	02/03/2010	N		X											X
214	214-STEP-03	0.5	1006N041	02/04/2010	N		X											X
214	214-STEP-03	2.5	1006N042	02/04/2010	N		X											X
214	214-STEP-03	4.5	1006N043	02/04/2010	N		X											X
214	214-STEP-03	8.5	1006N044	02/04/2010	N		X											X
214	214-STEP-03	9.5	1006N045	02/04/2010	N		X											X
214	214-STEP-03	6.5	1006N046	02/04/2010	N		X											X
231E	231E-S-01	0.5	1002W010	01/07/2010	N		X											
231E	231E-S-01	2.5	1003G001	01/11/2010	N		X											
231E	231E-S-02	0.5	1003G004	01/12/2010	N		X				X	X	X		X	X		X
134	134-S-01	0.5	1002W003	01/05/2010	EB	X					X	X	X		X	X	X	X
134	134-S-02	0.5	1002W007	01/06/2010	EB	X					X	X	X		X	X	X	X
203	203-S-02	0.5	1002N005	01/05/2010	EB	X		X		X								X
203	203-S-02	2.5	1002N026	01/08/2010	EB	X		X		X								X
203	203-S-04	2.5	1002N012	01/06/2010	EB	X			X					X			X	X

TABLE 1
Sample Summary for Soil and Field Quality Control Samples

Building	Borehole ID	Sample Depth ¹	Sample ID	Sample Date	Sample Type	Copper	Lead	Mang	Organic Lead	Mercury	TPH gasoline	TPH diesel	TPH motor oil	Aroclor-1260	BTEX	MTBE	Naph	SVOCs / PAHs
Analytical Method ²						EPA 6010C			HML 939M ³	EPA 7471B / 7470A ⁴	EPA 8015C			EPA 8082	EPA 8260B			EPA 8270D / 8270D SIM
203	203-S-04	4.5	1002N022	01/07/2010	EB	X			X								X	X
203	203-S-08	0.5	1002D006	01/08/2010	EB			X										
214	214-S-01	6.5	1002N021	01/07/2010	EB		X											X
214	214-STEP-02	4.5	1006N040	02/03/2010	EB		X											X
214	214-STEP-02	9.5	1006N039	02/03/2010	EB		X											X
214	214-STEP-03	4.5	1006N047	02/04/2010	EB		X											X
214	214-STEP-03	9.5	1006N048	02/04/2010	EB		X											X
231E	231E-S-01	0.5	1002W011	01/07/2010	EB		X											
231E	231E-S-01	2.5	1003G002	01/11/2010	EB		X											
231E	231E-S-02	2.5	1003G005	01/12/2010	EB		X				X	X	X		X	X	X	X
FQC	DI WATER	NA	1003G006	01/12/2010	SB	X	X	X	X	X	X	X	X	X	X	X	X	X
FQC	TAP WATER	NA	1003G007	01/12/2010	SB	X	X	X	X	X	X	X	X	X	X	X	X	X
FQC	DI-STEPOUT	NA	1006N050	02/04/2010	SB		X											X
FQC	TAP-STEPOUT	NA	1006N049	02/04/2010	SB		X											X
FQC	TRIP BLANK	NA	1002N001	01/05/2010	TB						X						X	
FQC	TRIP BLANK	NA	1002W001	01/05/2010	TB						X				X	X	X	
FQC	TRIP BLANK	NA	1002X001	01/05/2010	TB						X				X	X	X	
FQC	TRIP BLANK	NA	1002N006	01/06/2010	TB												X	
FQC	TRIP BLANK	NA	1002W004	01/06/2010	TB						X				X	X	X	
FQC	TRIP BLANK	NA	1002X002	01/06/2010	TB						X				X	X	X	
FQC	TRIP BLANK	NA	1002N013	01/07/2010	TB												X	
FQC	TRIP BLANK	NA	1002W008	01/07/2010	TB						X				X	X	X	
FQC	TRIP BLANK	NA	1002X003	01/07/2010	TB						X				X	X	X	
FQC	TRIP BLANK	NA	1002N023	01/08/2010	TB										X		X	
FQC	TRIP BLANK	NA	1003G003	01/12/2010	TB						X				X	X	X	

Notes:

- Sample depths are presented in feet below concrete slab.
- The organic lead analytical method is the California Department of Toxic Substances Control Hazardous Material Laboratory method 939M.
- The remaining analytical methods are from the U.S. Environmental Protection Agency's Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846, third edition.
- Mercury was analyzed by EPA method 7471B for soil samples and by EPA method 7470A for aqueous (field quality control) samples.

Acronyms/Abbreviations:

BTEX benzene, toluene, ethylbenzene, and total xylenes
DI deionized water
EB equipment rinsate sample
EPA Environmental Protection Agency
FQC field quality control
HML Hazardous Material Laboratory
ID identification
Mang manganese
N regular sample
NA not applicable
Naph naphthalene
PAHs polycyclic aromatic hydrocarbons
SB source blank sample
SVOCs semivolatile organic compounds
SIM selected ion monitoring
TAP tap water
TB trip blank
TPH total petroleum hydrocarbon

TABLE 2

Detected Results and Regulatory Criteria Exceedances from Building 134 Soil Samples

					Sample Location	134-S-01	134-S-01	134-S-02	134-S-02
					Sample Identification	1002W002	1002W005	1002W006	1002W009
					Sample Date	01/05/2010	01/06/2010	01/06/2010	01/07/2010
					Start Depth (feet below aggregate base)	0.5	2.5	0.5	2.5
Method	Chemical	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria	Units					
EPA 6010C	copper	160	NC	mg/kg	31.4 J	38.6 J	0.6 UJ	17.9 J	
EPA 8015C	TPH-diesel range organics C12-C24	NC	35	mg/kg	13 J	1.2 U	82 J	12 J	
EPA 8015C	TPH-motor oil C24-C36	NC	1,850	mg/kg	39	12.0 U	32	31	
EPA 8270D	bis(2-ethylhexyl) phthalate	1.1	NC	mg/kg	0.770 U	0.770 U	3.7 U	0.1 J	
EPA 8270D SIM	1-methylnaphthalene	NC	0.58	mg/kg	0.0048 J	0.0059 U	0.011 J	0.0012 J	
EPA 8270D SIM	2-methylnaphthalene	NC	0.58	mg/kg	0.0076	0.0059 U	0.022 J	0.0018 J	
EPA 8270D SIM	acenaphthylene	NC	25	mg/kg	0.0013 J	0.0059 U	0.001 J	0.0026 J	
EPA 8270D SIM	anthracene	NC	230	mg/kg	0.0014 J	0.0059 U	0.028 U	0.0039 J	
EPA 8270D SIM	benzo[a]anthracene	0.37	0.38	mg/kg	0.0062	0.0059 U	0.028 U	0.0065	
EPA 8270D SIM	benzo[a]pyrene	0.33	0.038	mg/kg	0.0081	0.0059 U	0.028 U	0.0086	
EPA 8270D SIM	benzo[b]fluoranthene	0.34	0.38	mg/kg	0.024	0.0059 U	0.028 U	0.035	
EPA 8270D SIM	benzo[g,h,i]perylene	NC	340	mg/kg	0.013	0.0059 U	0.028 U	0.013	
EPA 8270D SIM	benzo[k]fluoranthene	0.34	0.38	mg/kg	0.028	0.0059 U	0.028 U	0.038	
EPA 8270D SIM	chrysene	3.3	14	mg/kg	0.0098	0.0059 U	0.028 U	0.012	
EPA 8270D SIM	dibenzo[a,h]anthracene	0.33	NC	mg/kg	0.0032 J	0.0059 U	0.028 U	0.0036 J	
EPA 8270D SIM	fluoranthene	NC	100	mg/kg	0.0096	0.0059 U	0.028 U	0.01	
EPA 8270D SIM	fluorene	NC	140	mg/kg	0.0012 J	0.0059 U	0.028 U	0.0056 U	
EPA 8270D SIM	indeno[1,2,3-c,d]pyrene	0.35	0.62	mg/kg	0.0067	0.0059 U	0.028 U	0.0093	
EPA 8270D SIM	naphthalene	1.7	0.019	mg/kg	0.0031 J	0.0059 U	0.024 J	0.0018 J	
EPA 8270D SIM	phenanthrene	NC	140	mg/kg	0.0077	0.0059 U	0.041	0.0091	
EPA 8270D SIM	pyrene	NC	730	mg/kg	0.01	0.0059 U	0.028 U	0.013	

Notes:

Only compounds reported above the laboratory method detection limits are presented.

The evaluation criteria are the Draft Parcel C ROD remediation goals for soil for residential land use from the Internal Draft Record of Decision (March 2009) and the TPH CAP Tier 1 screening criteria for residential land use and shallow soils, both are labeled "Draft Parcel C ROD Remedial Goals" and "TPH CAP Tier 1 Criteria", respectively. Results were compared to the TPH CAP Tier 1 criteria because they represent the most conservative criteria available for the TPH CAP.

TABLE 2

Detected Results and Regulatory Criteria Exceedances from Building 134 Soil Samples

BOLD = reported concentration above the laboratory method detection limits

Shaded = concentration exceeded the Draft Parcel C ROD Remedial Goals

Outline = concentration exceeded TPH CAP Tier 1 Criteria

— = compound not analyzed for this sample

Abbreviations/Acronyms:

CAP	Corrective Action Plan
EPA	U.S. Environmental Protection Agency
J	estimated result
mg/kg	milligram per kilogram
NC	no criteria existing for the compound
ROD	Record of Decision
SIM	selected ion monitoring
TPH	total petroleum hydrocarbon
U	nondetected result
UJ	estimated nondetected result
ug/kg	microgram per kilogram

TABLE 3
Detected Results and Regulatory Criteria Exceedances from Building 203 Soil Samples

Sample Location Sample Identification Sample Date					203-S-01 1002N002 01/05/2010	203-S-01 1002N003 01/05/2010	203-S-02 1002N004 01/05/2010	203-S-03 1002N007 01/06/2010	203-S-03 1002N008 01/06/2010	203-S-03 1002N009 01/06/2010	203-S-04 1002N010 01/06/2010	203-S-04 1002N011 01/06/2010	203-S-04 1002N014 01/07/2010	203-S-05 1002D002 01/08/2010	203-S-05 1002D003 01/08/2010	203-S-06 1002N024 01/08/2010	203-S-06 1002N025 01/08/2010	203-S-07 1002D004 01/08/2010	203-S-08 1002D005 01/08/2010
Start Depth (feet below bottom of aggregate base)					0.5	2.5	0.5	0.5	2.5	4.5	0.5	2.5	4.5	0.5	2.5	0.5	2.5	0.5	0.5
Method	Chemical	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria	Units															
HML 939M	organic lead	0.5	NC	mg/kg	---	---	---	0.198	0.00908 J	0.0105 U	0.0104 U	0.0104 U	0.0105 U	---	---	0.0104 U	0.0105 U	---	---
EPA 6010C	copper	160	NC	mg/kg	---	---	40.4 J	22.8 J	16.9 J	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	9.8	11.0	---	---	---	---
EPA 6010C	lead	155	NC	mg/kg	---	---	---	---	---	---	---	---	---	2.9	6.1 J	---	---	---	---
EPA 6010C	manganese	1,431	NC	mg/kg	---	---	1150 J	---	---	---	---	---	---	309	321 J	---	---	---	1380
EPA 7471B	mercury	2.28	NC	mg/kg	---	---	0.22	---	---	---	---	---	---	---	---	---	---	---	---
EPA 8015C	TPH-diesel range organics C12-C24	NC	35	mg/kg	---	---	---	---	---	---	---	---	---	---	---	1.0 U	9.1 J	---	---
EPA 8015C	TPH-motor oil C24-C36	NC	1,850	mg/kg	---	---	---	---	---	---	---	---	---	---	---	10.0 U	26	---	---
EPA 8082	aroclor-1260	0.21	NC	mg/kg	---	---	---	0.12 J	0.02 U	0.02 U	---	---	---	0.02 U	0.02 U	---	---	0.052	---
EPA 8270D	bis(2-ethylhexyl) phthalate	1.1	NC	mg/kg	0.66 U	0.68 U	0.7 U	---	---	---	0.68 U	0.12 J	0.19 J	---	---	0.69 U	0.7 U	---	---
EPA 8270D SIM	1-methylnaphthalene	NC	0.58	mg/kg	0.005 U	0.0051 U	0.002 J	---	---	---	0.0013 J	0.0019 J	0.0063	---	---	0.0052 U	0.0053 U	---	---
EPA 8270D SIM	2-methylnaphthalene	NC	0.58	mg/kg	0.005 U	0.0051 U	0.0027 J	---	---	---	0.0031 J	0.0049 J	0.0075	---	---	0.0052 U	0.0053 U	---	---
EPA 8270D SIM	acenaphthene	NC	520	mg/kg	0.005 U	0.0011 J	0.0012 J	---	---	---	0.0052 U	0.0052 U	0.0053 U	---	---	0.0052 U	0.0053 U	---	---
EPA 8270D SIM	acenaphthylene	NC	25	mg/kg	0.005 U	0.0051 U	0.0053 U	---	---	---	0.00099 J	0.00093 J	0.0014 J	---	---	0.0052 U	0.0017 J	---	---
EPA 8270D SIM	anthracene	NC	230	mg/kg	0.005 U	0.0021 J	0.0028 J	---	---	---	0.0013 J	0.001 J	0.0011 J	---	---	0.00095 J	0.003 J	---	---
EPA 8270D SIM	benzo[a]anthracene	0.37	0.380	mg/kg	0.005 U	0.0076	0.015	---	---	---	0.008	0.0058	0.0074	---	---	0.0087	0.019	---	---
EPA 8270D SIM	benzo[a]pyrene	0.33	0.038	mg/kg	0.005 U	0.0044 J	0.014	---	---	---	0.0083	0.0055	0.011	---	---	0.0093	0.019	---	---
EPA 8270D SIM	benzo[b]fluoranthene	0.34	0.380	mg/kg	0.005 U	0.0098	0.029	---	---	---	0.017	0.016	0.019	---	---	0.015	0.031	---	---
EPA 8270D SIM	benzo[g,h,i]perylene	NC	340	mg/kg	0.005 U	0.0026 J	0.012	---	---	---	0.0089	0.0074	0.014	---	---	0.0078	0.018	---	---
EPA 8270D SIM	benzo[k]fluoranthene	0.34	0.380	mg/kg	0.005 U	0.011	0.033	---	---	---	0.018	0.017	0.021	---	---	0.016	0.035	---	---
EPA 8270D SIM	chrysene	3.3	14	mg/kg	0.005 U	0.009	0.019	---	---	---	0.013	0.01	0.012	---	---	0.0095	0.02	---	---
EPA 8270D SIM	dibenzo[a,h]anthracene	0.33	NC	mg/kg	0.005 U	0.001 J	0.0031 J	---	---	---	0.0018 J	0.0016 J	0.0019 J	---	---	0.0018 J	0.0035 J	---	---
EPA 8270D SIM	fluoranthene	NC	100	mg/kg	0.005 U	0.016	0.024	---	---	---	0.018	0.013	0.027	---	---	0.016	0.04	---	---
EPA 8270D SIM	fluorene	NC	140	mg/kg	0.005 U	0.0051 U	0.0012 J	---	---	---	0.0052 U	0.0052 U	0.0053 U	---	---	0.0052 U	0.0053 U	---	---
EPA 8270D SIM	indeno[1,2,3-c,d]pyrene	0.35	0.62	mg/kg	0.005 U	0.0019 J	0.008	---	---	---	0.0067	0.005 J	0.0094	---	---	0.0062	0.013	---	---
EPA 8270D SIM	naphthalene	1.7	0.019	mg/kg	0.005 U	0.0051 U	0.0023 J	---	---	---	0.0025 J	0.0027 J	0.016	---	---	0.0052 U	0.0018 J	---	---
EPA 8270D SIM	phenanthrene	NC	140	mg/kg	0.005 U	0.011	0.015	---	---	---	0.01	0.0067	0.014	---	---	0.0066	0.018	---	---
EPA 8270D SIM	pyrene	NC	730	mg/kg	0.005 U	0.014	0.025	---	---	---	0.022	0.013	0.032	---	---	0.019	0.051	---	---

Notes:
Only compounds reported above the laboratory method detection limits are presented.
The evaluation criteria are the Draft Parcel C ROD remediation goals for soil for residential land use from the Internal Draft Record of Decision (March 2009) and

TABLE 3
Detected Results and Regulatory Criteria Exceedances from Building 203 Soil Samples

					Sample Location	203-S-01	203-S-01	203-S-02	203-S-03	203-S-03	203-S-03	203-S-04	203-S-04	203-S-04	203-S-05	203-S-05	203-S-06	203-S-06	203-S-07	203-S-08
					Sample Identification	1002N002	1002N003	1002N004	1002N007	1002N008	1002N009	1002N010	1002N011	1002N014	1002D002	1002D003	1002N024	1002N025	1002D004	1002D005
					Sample Date	01/05/2010	01/05/2010	01/05/2010	01/06/2010	01/06/2010	01/06/2010	01/06/2010	01/06/2010	01/07/2010	01/08/2010	01/08/2010	01/08/2010	01/08/2010	01/08/2010	01/08/2010
					Start Depth (feet below bottom of aggregate base)	0.5	2.5	0.5	0.5	2.5	4.5	0.5	2.5	4.5	0.5	2.5	0.5	2.5	0.5	0.5
Method	Chemical	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria	Units																

the TPH CAP Tier 1 screening criteria for residential land use and shallow soils, both are labeled "Draft Parcel C ROD Remedial Goals" and "TPH CAP Tier 1 Criteria", respectively.
Results were compared to the TPH CAP Tier 1 criteria because they represent the most conservative criteria available for the TPH CAP.

BOLD = reported concentration above the laboratory method detection limits
Shaded = concentration exceeded the Draft Parcel C ROD Remedial Goals
Outline = concentration exceeded TPH CAP Tier 1 Criteria
--- = compound not analyzed for this sample

Abbreviations/Acronyms:

CAP	Corrective Action Plan
HML	California Department of Toxic Substances Control Hazardous Material Laboratory
EPA	U.S. Environmental Protection Agency
J	estimated result
mg/kg	milligram per kilogram
NC	no criteria existing for the compound
ROD	Record of Decision
SIM	selected ion monitoring
TPH	total petroleum hydrocarbon
U	nondetected result
UJ	estimated nondetected result
ug/kg	microgram per kilogram

TABLE 4
Detected Results and Regulatory Criteria Exceedances from Building 214
Soil Samples

Sample Location Sample Identification Sample Date Start Depth (feet below aggregate base)					214-S-01 1002N015 01/07/2010 0.4	214-S-01 1002N016 01/07/2010 2.2	214-S-01 1002N017 01/07/2010 3.9	214-S-01 1002N020 01/07/2010 5.6	214-S-01 1002N019 01/07/2010 7.4	214-S-01 1002N018 01/07/2010 8.2	214-STEP-01 1006N027 02/03/2010 0.5	214-STEP-01 1006N028 02/03/2010 2.5	214-STEP-01 1006N029 02/03/2010 4.5	214-STEP-01 1006N030 02/03/2010 6.5	214-STEP-01 1006N031 02/03/2010 8.5	214-STEP-01 1006N032 02/03/2010 9.5	214-STEP-02 1006N033 02/03/2010 0.5	214-STEP-02 1006N034 02/03/2010 2.5	214-STEP-02 1006N035 02/03/2010 4.5
Method	Chemical	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria	Units															
EPA 6010C	lead	155	NC	mg/kg	89.2 J	0.6 UJ	43.7 J	16.9 J	66.9 J	356 J	37.9 J	12.7 J	123 J	80.0 J	19.2 J	19.7 J	61.7 J	42.5 J	5.8 J
EPA 8270D	bis(2-ethylhexyl) phthalate	1.1	NC	mg/kg	0.21 J	0.13 J	0.17 J	0.19 J	0.18 J	0.45 J	0.74 U	0.77 U	0.86 U	0.79 U	0.84 U	0.86 U	3.5 U	0.75 U	0.77 U
EPA 8270D SIM	1-methylnaphthalene	NC	0.58	mg/kg	0.0024 J	0.0062 U	0.017	0.033	0.0015 J	0.47	0.0056 U	0.0058 U	0.0065 U	0.0013 J	0.0063 U	0.0018 J	0.026 U	0.0057 U	0.0058 U
EPA 8270D SIM	2-methylnaphthalene	NC	0.58	mg/kg	0.0047 J	0.0062 U	0.026	0.037	0.0033 J	0.79	0.0013 J	0.0058 U	0.0065 U	0.0014 J	0.0063 U	0.0021 J	0.026 U	0.0057 U	0.0058 U
EPA 8270D SIM	acenaphthene	NC	520	mg/kg	0.006 U	0.0062 U	0.012	0.017	0.0015 J	0.25	0.0056 U	0.0058 U	0.0065 U	0.006 U	0.0063 U	0.0065 U	0.026 U	0.0016 J	0.0058 U
EPA 8270D SIM	acenaphthylene	NC	25	mg/kg	0.011	0.0062 U	0.074	0.15	0.017	0.73	0.0039 J	0.0031 J	0.0018 J	0.003 J	0.0033 J	0.01	0.0049 J	0.0017 J	0.0058 U
EPA 8270D SIM	anthracene	NC	230	mg/kg	0.0061	0.0062 U	0.2	0.37	0.045	2.9	0.0035 J	0.0021 J	0.002 J	0.0026 J	0.0029 J	0.0058 J	0.026 U	0.0046 J	0.0058 U
EPA 8270D SIM	benzo[a]anthracene	0.37	0.38	mg/kg	0.045	0.0062 U	1.1	1.2	0.16	8.3	0.029	0.016	0.015	0.021	0.023	0.055	0.021 J	0.026	0.0026 J
EPA 8270D SIM	benzo[a]pyrene	0.33	0.038	mg/kg	0.054	0.0062 U	0.87	0.99	0.15	7.3	0.029	0.015	0.014	0.02	0.02	0.055	0.034	0.022	0.0022 J
EPA 8270D SIM	benzo[b]fluoranthene	0.34	0.38	mg/kg	0.091	0.0062 U	1.3	1.6	0.22	8.6	0.041	0.022	0.019	0.026	0.029	0.079	0.048	0.033	0.0048 J
EPA 8270D SIM	benzo[g,h,i]perylene	NC	340	mg/kg	0.049	0.0062 U	0.69	0.55	0.094	4	0.03	0.03	0.012	0.024	0.014	0.049	0.11	0.025	0.0058 U
EPA 8270D SIM	benzo[k]fluoranthene	0.34	0.38	mg/kg	0.1	0.0062 U	1.5	1.7	0.26	9.7	0.011	0.0064	0.0065	0.0077	0.0092	0.02	0.0059 J	0.008	0.0034 J
EPA 8270D SIM	chrysene	3.3	14	mg/kg	0.066	0.0062 U	1.1	1.2	0.16	8.8	0.023	0.014	0.012	0.018	0.018	0.046	0.056	0.018	0.0019 J
EPA 8270D SIM	dibenzo[a,h]anthracene	0.33	NC	mg/kg	0.013	0.0062 U	0.22	0.18	0.027	1.2	0.0069	0.0068	0.0033 J	0.0048 J	0.0043 J	0.012	0.032	0.0065	0.0058 U
EPA 8270D SIM	fluoranthene	NC	100	mg/kg	0.081	0.0062 U	1.5	2	0.23	11	0.05	0.032	0.026	0.037	0.042	0.071	0.024 J	0.044	0.0027 J
EPA 8270D SIM	fluorene	NC	140	mg/kg	0.0022 J	0.0062 U	0.046	0.11	0.0092	0.73	0.0056 U	0.0058 U	0.0065 U	0.006 U	0.0063 U	0.0065 U	0.026 U	0.0057 U	0.0058 U
EPA 8270D SIM	indeno[1,2,3-c,d]pyrene	0.35	0.62	mg/kg	0.039	0.0062 U	0.67	0.55	0.083	3.9	0.024	0.017	0.012	0.015	0.014	0.045	0.029	0.017	0.0058 U
EPA 8270D SIM	naphthalene	1.7	0.019	mg/kg	0.0051 J	0.0062 U	0.052	0.059	0.0088	1.1	0.0025 J	0.0017 J	0.0065 U	0.0011 J	0.0015 J	0.0022 J	0.026 U	0.0057 U	0.0058 U
EPA 8270D SIM	phenanthrene	NC	140	mg/kg	0.055	0.0062 U	1	1.7	0.11	6.7	0.02	0.018	0.0088	0.021	0.016	0.025	0.017 J	0.024	0.0013 J
EPA 8270D SIM	pyrene	NC	730	mg/kg	0.097	0.0062 U	1.7	2.3	0.29	16	0.041	0.03	0.022	0.035	0.032	0.07	0.023 J	0.035	0.0028 J

Notes:
Only compounds reported above the laboratory method detection limits are presented.
The evaluation criteria are the Draft Parcel C ROD remediation goals for soil for residential land use from the Internal Draft Record of Decision (March 2009) and the TPH CAP Tier 1 screening criteria for residential land use and shallow soils, both are labeled "Draft Parcel C ROD Remedial Goals" and "TPH CAP Tier 1 Criteria", respectively. Results were compared to the TPH CAP Tier 1 criteria because they represent the most conservative criteria available for the TPH CAP.

BOLD = reported concentration above the laboratory method detection limits
Shaded = concentration exceeded the Draft Parcel C ROD Remedial Goals
Outline = concentration exceeded TPH CAP Tier 1 Criteria
— = compound not analyzed for this sample

Abbreviations/Acronyms:
CAP Corrective Action Plan
EPA U.S. Environmental Protection Agency
J estimated result
mg/kg milligram per kilogram
NC no criteria existing for the compound
ROD Record of Decision
SIM selected ion monitoring
U nondetected result
UJ estimated nondetected result

TABLE 4
Detected Results and Regulatory Criteria Exceedances from Building 214
Soil Samples

Sample Location Sample Identification Sample Date Start Depth (feet below aggregate base)					214-STEP-02 1006N036 02/03/2010 6.5	214-STEP-02 1006N037 02/03/2010 8.5	214-STEP-02 1006N038 02/03/2010 9.5	214-STEP-03 1006N041 02/04/2010 0.5	214-STEP-03 1006N042 02/04/2010 2.5	214-STEP-03 1006N043 02/04/2010 4.5	214-STEP-03 1006N046 02/04/2010 6.5	214-STEP-03 1006N044 02/04/2010 8.5	214-STEP-03 1006N045 02/04/2010 9.5
Method	Chemical	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria	Units									
EPA 6010C	lead	155	NC	mg/kg	85.5 J	40.1 J	49.0 J	32.6 J	55.7 J	29.2 J	44.7 J	31.9 J	8.0 J
EPA 8270D	bis(2-ethylhexyl) phthalate	1.1	NC	mg/kg	0.79 U	0.81 U	0.89 U	0.001 J	0.78 U	0.28 J	0.65 J	0.77 U	0.73 U
EPA 8270D SIM	1-methylnaphthalene	NC	0.58	mg/kg	0.006 U	0.0062 U	0.0067 U	0.028 U	0.0059 U	0.0013 J	0.0059 U	0.0058 U	0.0055 U
EPA 8270D SIM	2-methylnaphthalene	NC	0.58	mg/kg	0.006 U	0.0062 U	0.0067 U	0.028 U	0.0059 U	0.0019 J	0.0059 U	0.0058 U	0.0055 U
EPA 8270D SIM	acenaphthene	NC	520	mg/kg	0.006 U	0.0062 U	0.0067 U	0.028 U	0.0059 U	0.0058 U	0.0011 J	0.0058 U	0.0055 U
EPA 8270D SIM	acenaphthylene	NC	25	mg/kg	0.006 U	0.0062 U	0.0013 J	0.028 U	0.0059 U	0.006	0.0029 J	0.0011 J	0.0055 U
EPA 8270D SIM	anthracene	NC	230	mg/kg	0.006 U	0.0062 U	0.0067 U	0.0083 J	0.0015 J	0.0094	0.0043 J	0.0014 J	0.0055 U
EPA 8270D SIM	benzo[a]anthracene	0.37	0.38	mg/kg	0.0052 J	0.0043 J	0.0045 J	0.047	0.0084	0.082	0.073	0.011	0.0027 J
EPA 8270D SIM	benzo[a]pyrene	0.33	0.038	mg/kg	0.004 J	0.0038 J	0.0041 J	0.045	0.0089	0.083	0.094	0.011	0.0055 U
EPA 8270D SIM	benzo[b]fluoranthene	0.34	0.38	mg/kg	0.0075	0.0067	0.0074	0.087	0.012	0.13	0.14	0.014	0.0055 U
EPA 8270D SIM	benzo[g,h,i]perylene	NC	340	mg/kg	0.0045 J	0.0035 J	0.0037 J	0.081	0.0098	0.094	0.096	0.0094	0.0055 U
EPA 8270D SIM	benzo[k]fluoranthene	0.34	0.38	mg/kg	0.0058 J	0.0051 J	0.0056 J	0.017 J	4.2 J	0.028	0.026	0.0054 J	0.0055 U
EPA 8270D SIM	chrysene	3.3	14	mg/kg	0.0045 J	0.0036 J	0.0045 J	0.098	0.0066	0.065	0.051	0.0095	0.0015 J
EPA 8270D SIM	dibenzo[a,h]anthracene	0.33	NC	mg/kg	0.0013 J	0.0014 J	0.0067 U	0.021 J	0.002 J	0.021	0.02	0.0029 J	0.0055 U
EPA 8270D SIM	fluoranthene	NC	100	mg/kg	0.0068	0.006 J	0.008	0.091	0.012	0.082	0.071	0.016	0.003 J
EPA 8270D SIM	fluorene	NC	140	mg/kg	0.006 U	0.0062 U	0.0067 U	0.028 U	0.0059 U	0.0058 U	0.0059 U	0.0058 U	0.0055 U
EPA 8270D SIM	indeno[1,2,3-c,d]pyrene	0.35	0.62	mg/kg	0.0028 J	0.0031 J	0.0032 J	0.037	0.0082	0.078	0.083	0.0085	0.0055 U
EPA 8270D SIM	naphthalene	1.7	0.019	mg/kg	0.006 U	0.0062 U	0.0067 U	0.028 U	0.0059 U	0.0025 J	0.0059 U	0.0058 U	0.0055 U
EPA 8270D SIM	phenanthrene	NC	140	mg/kg	0.0039 J	0.0032 J	0.0067	0.055	0.0049 J	0.038	0.022	0.0068	0.0021 J
EPA 8270D SIM	pyrene	NC	730	mg/kg	0.0072	0.0058 J	0.0081	0.065	0.012	0.076	0.056	0.014	0.0029 J

Notes:
Only compounds reported above the laboratory method detection limits are presented.
The evaluation criteria are the Draft Parcel C ROD remediation goals for soil for residential land use from the Internal Draft Record of Decision (March 2009) and the TPH CAP Tier 1 screening criteria for residential land use and shallow soils, both are labeled "Draft Parcel C ROD Remedial Goals" and "TPH CAP Tier 1 Criteria", respectively. Results were compared to the TPH CAP Tier 1 criteria because they represen

BOLD = reported concentration above the laboratory method detection limits
Shaded = concentration exceeded the Draft Parcel C ROD Remedial Goals
Outline = concentration exceeded TPH CAP Tier 1 Criteria
— = compound not analyzed for this sample

Abbreviations/Acronyms:
CAP Corrective Action Plan
EPA U.S. Environmental Protection Agency
J estimated result
mg/kg milligram per kilogram
NC no criteria existing for the compound
ROD Record of Decision
SIM selected ion monitoring
U nondetected result
UJ estimated nondetected result

TABLE 5

Detected Results and Regulatory Criteria Exceedances from Building 231E Soil Samples

					Sample Location	231E-S-01	231E-S-01	231E-S-02
					Sample Identification	1002W010	1003G001	1003G004
					Sample Date	01/07/2010	01/11/2010	01/12/2010
Start Depth (feet below bottom of aggregate base)						0.5	2.5	0.5
Method	Chemical	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria	Units				
EPA 6010C	lead	155	NC	mg/kg	1.9 J	274 J		62.4
EPA 8015C	TPH-diesel range organics C12-C24	NC	35	mg/kg	---	---		7.0 J
EPA 8015C	TPH-motor oil C24-C36	NC	1,850	mg/kg	---	---		20
EPA 8260B	benzene	0.18	0.005	mg/kg	---	---		0.00095 J
EPA 8270D SIM	1-methylnaphthalene	NC	0.58	mg/kg	---	---		0.0016 J
EPA 8270D SIM	2-methylnaphthalene	NC	0.58	mg/kg	---	---		0.0022 J
EPA 8270D SIM	acenaphthene	NC	520	mg/kg	---	---		0.0019 J
EPA 8270D SIM	acenaphthylene	NC	25	mg/kg	---	---		0.0043 J
EPA 8270D SIM	anthracene	NC	230	mg/kg	---	---		0.032
EPA 8270D SIM	benzo[a]anthracene	0.37	0.38	mg/kg	---	---		0.05
EPA 8270D SIM	benzo[a]pyrene	0.33	0.038	mg/kg	---	---		0.041
EPA 8270D SIM	benzo[b]fluoranthene	0.34	0.38	mg/kg	---	---		0.068
EPA 8270D SIM	benzo[g,h,i]perylene	NC	340	mg/kg	---	---		0.027
EPA 8270D SIM	benzo[k]fluoranthene	0.34	0.38	mg/kg	---	---		0.076
EPA 8270D SIM	chrysene	3.3	14	mg/kg	---	---		0.057
EPA 8270D SIM	dibenzo[a,h]anthracene	0.33	NC	mg/kg	---	---		0.007
EPA 8270D SIM	fluoranthene	NC	100	mg/kg	---	---		0.093
EPA 8270D SIM	fluorene	NC	140	mg/kg	---	---		0.0038 J
EPA 8270D SIM	indeno[1,2,3-c,d]pyrene	0.35	0.62	mg/kg	---	---		0.023
EPA 8270D SIM	naphthalene	1.7	0.019	mg/kg	---	---		0.0017 J
EPA 8270D SIM	phenanthrene	NC	140	mg/kg	---	---		0.055
EPA 8270D SIM	pyrene	NC	730	mg/kg	---	---		0.1

Notes:

Only compounds reported above the laboratory method detection limits are presented.

TABLE 5

Detected Results and Regulatory Criteria Exceedances from Building 231E Soil Samples

The evaluation criteria are the Draft Parcel C ROD remediation goals for soil for residential land use from the Internal Draft Record of Decision (March 2009) and the TPH CAP Tier 1 screening criteria for residential land use and shallow soils, both are labeled "Draft Parcel C ROD Remedial Goals" and "TPH CAP Tier 1 Criteria", respectively.

BOLD = reported concentration above the laboratory method detection limits

Shaded = concentration exceeded the Draft Parcel C ROD Remedial Goals

Outline = concentration exceeded TPH CAP Tier 1 Criteria

— = compound not analyzed for this sample

Abbreviations/Acronyms:

CAP	Corrective Action Plan
EPA	U.S. Environmental Protection Agency
J	estimated result
mg/kg	milligram per kilogram
NC	no criteria existing for the compound
ROD	Record of Decision
SIM	selected ion monitoring
TPH	total petroleum hydrocarbon
ug/kg	microgram per kilogram

TABLE 6
Analytical Results from Field Quality Control Samples

Sample Location Sample Identification Sample Type Sample Date Start Depth (feet below aggregate base)			134-S-01 1002W003 EB 01/05/2010 0.5	134-S-02 1002W007 EB 01/06/2010 0.5	203-S-02 1002N005 EB 01/05/2010 0.5	203-S-02 1002N026 EB 01/08/2010 2.5	203-S-04 1002N012 EB 01/06/2010 2.5	203-S-04 1002N022 EB 01/07/2010 4.5	203-S-08 1002D006 EB 01/08/2010 0.5	214-S-01 1002N021 EB 01/07/2010 6.5	214-STEP-02 1006N040 EB 02/03/2010 4.5	214-STEP-02 1006N039 EB 02/03/2010 9.5	214-STEP-03 1006N047 EB 02/04/2010 4.5	214-STEP-03 1006N048 EB 02/04/2010 9.5	231E-S-01 1002W011 EB 01/07/2010 0.5	231E-S-01 1003G002 EB 01/11/2010 2.5	231E-S-02 1003G005 EB 01/12/2010 2.5	DI WATER 1003G006 SB 01/12/2010 NA	TAP WATER 1003G007 SB 01/12/2010 NA	DI-STEP-OUT 1006N050 SB 02/04/2010 NA	TAP-STEP-OUT 1006N049 SB 02/04/2010 NA	TRIP BLANK 1002N001 TB 01/05/2010 NA
Method	Chemical	Units																				
HML 939M	organic lead	mg/l	---	---	---	---	0.00500 U	0.00500 U	---	---	---	---	---	---	---	---	---	---	0.00500 U	0.00500 U	---	---
EPA 6010C	copper	ug/l	5.0 U	500	5.0 U	1.3 J	549	567 J	---	---	---	---	---	---	---	---	---	11.3	13.7	---	---	
EPA 6010C	lead	ug/l	---	---	---	---	---	---	---	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	7.0	
EPA 6010C	manganese	ug/l	---	---	1.3 J	5.0 U	---	---	5.0 U	---	---	---	---	---	---	---	---	5.0 U	8.9	---	---	
EPA 7470A	mercury	ug/l	---	---	0.070 J	0.2 UJ	---	---	---	---	---	---	---	---	---	---	---	0.2 U	0.2 U	---	---	
EPA 8015C	TPH-gasoline range organics C4-C12	ug/l	20.0 U	20.0 U	---	---	---	---	---	---	---	---	---	---	---	---	---	20.0 U	20.0 U	20.0 U	---	
EPA 8015C	TPH-diesel range organics C12-C24	ug/l	40.0 U	40.0 U	---	---	---	---	---	---	---	---	---	---	---	---	---	40.0 U	40.0 U	40.0 U	---	
EPA 8015C	TPH-motor oil C24-C36	ug/l	40.0 U	40.0 U	---	---	---	---	---	---	---	---	---	---	---	---	---	40.0 U	40.0 U	40.0 U	---	
EPA 8082	aroclor-1260	ug/l	---	---	---	---	0.10 U	---	---	---	---	---	---	---	---	---	---	0.10 U	0.10 U	---	---	
EPA 8260B	benzene	ug/l	0.5 U	0.5 U	---	---	---	---	---	---	---	---	---	---	---	---	---	0.5 U	0.5 U	0.5 U	---	
EPA 8260B	ethylbenzene	ug/l	0.5 U	0.5 U	---	---	---	---	---	---	---	---	---	---	---	---	---	0.5 U	0.5 U	0.5 U	---	
EPA 8260B	methyl tert-butyl ether	ug/l	0.5 U	0.5 U	---	---	---	---	---	---	---	---	---	---	---	---	---	0.5 U	0.5 U	0.5 U	---	
EPA 8260B	naphthalene	ug/l	1.2 U	1.2 U	---	---	1.2 U	1.2 U	---	---	---	---	---	---	---	---	---	1.2 U	1.2 U	1.2 U	---	
EPA 8260B	toluene	ug/l	0.5 U	0.5 U	---	---	---	---	---	---	---	---	---	---	---	---	---	0.5 U	0.5 U	0.5 U	---	
EPA 8260B	xlenes, total	ug/l	0.5 U	0.5 U	---	---	---	---	---	---	---	---	---	---	---	---	---	0.5 U	0.5 U	0.5 U	---	
SW8270D	1,4-dichlorobenzene	ug/l	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	---	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	---	---	---	10.0 U	10.0 U	10.0 U	10.0 U	
SW8270D	3,3'-dichlorobenzidine	ug/l	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	---	20.0 U	20.0 U	20.0 U	20.0 U	20.0 U	---	---	---	20.0 U	20.0 U	20.0 U	20.0 U	
SW8270D	bis(2-ethylhexyl) phthalate	ug/l	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	---	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	---	---	---	5.0 U	5.0 U	5.0 U	5.0 U	
SW8270D	n-nitrosodi-n-propylamine	ug/l	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	---	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	---	---	---	10.0 U	10.0 U	10.0 U	10.0 U	
SW8270D	1-methylnaphthalene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	2-methylnaphthalene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	acenaphthene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	acenaphthylene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	anthracene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	benzo[a]anthracene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	benzo[a]pyrene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	benzo[b]fluoranthene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	benzo[g,h,i]perylene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	benzo[k]fluoranthene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	chrysene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	dibenzo[a,h]anthracene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	fluoranthene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.11 J	
SW8270D	fluorene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	indeno[1,2,3-c,d]pyrene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	naphthalene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	
SW8270D	phenanthrene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.081 J	
SW8270D	pyrene	ug/l	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	---	---	---	0.2 U	0.2 U	0.2 U	0.2 U	

Notes:
BOLD = reported result above the laboratory method detection limit.
--- = chemical not analyzed for this sample

Abbreviations/Acronyms:
DI deionized water
CAP Corrective Action Plan
EB equipment rinsate
EPA U.S. Environmental Protection Agency
HML California Department of Toxic Substances Control
 Hazardous Material Laboratory

J estimated result
mg/l milligram per liter
NA not applicable
SB source blank
SIM selected ion monitoring
TAP tap water
TB trip blank
TPH total petroleum hydrocarbon
U nondetected result
UJ estimated nondetected result
ug/l microgram per liter

TABLE 6
Analytical Results from Field Quality Control Samples

Sample Location Sample Identification Sample Type Sample Date Start Depth (feet below aggregate base)			TRIP BLANK 1002W001 TB 01/05/2010 NA	TRIP BLANK 1002X001 TB 01/05/2010 NA	TRIP BLANK 1002N006 TB 01/06/2010 NA	TRIP BLANK 1002W004 TB 01/06/2010 NA	TRIP BLANK 1002X002 TB 01/06/2010 NA	TRIP BLANK 1002N013 TB 01/07/2010 NA	TRIP BLANK 1002W008 TB 01/07/2010 NA	TRIP BLANK 1002X003 TB 01/07/2010 NA	TRIP BLANK 1002N023 TB 01/08/2010 NA	TRIP BLANK 1003G003 TB 01/12/2010 NA
Method	Chemical	Units										
HML 939M	organic lead	mg/l	---	---	---	---	---	---	---	---	---	---
EPA 6010C	copper	ug/l	---	---	---	---	---	---	---	---	---	---
EPA 6010C	lead	ug/l	---	---	---	---	---	---	---	---	---	---
EPA 6010C	manganese	ug/l	---	---	---	---	---	---	---	---	---	---
EPA 7470A	mercury	ug/l	---	---	---	---	---	---	---	---	---	---
EPA 8015C	TPH-gasoline range organics C4-C12	ug/l	20.0 U	20.0 U	---	20.0 U	20.0 U	---	20.0 U	20.0 U	---	20.0 U
EPA 8015C	TPH-diesel range organics C12-C24	ug/l	---	---	---	---	---	---	---	---	---	---
EPA 8015C	TPH-motor oil C24-C36	ug/l	---	---	---	---	---	---	---	---	---	---
EPA 8082	arodlor-1260	ug/l	---	---	---	---	---	---	---	---	---	---
EPA 8260B	benzene	ug/l	0.5 U	0.5 U	---	0.5 U	0.5 U	---	0.5 U	0.5 U	0.5 U	0.5 U
EPA 8260B	ethylbenzene	ug/l	0.5 U	0.5 U	---	0.5 U	0.5 U	---	0.5 U	0.5 U	0.5 U	0.5 U
EPA 8260B	methyl tert-butyl ether	ug/l	0.5 U	0.5 U	---	0.5 U	0.5 U	---	0.5 U	0.5 U	---	0.5 U
EPA 8260B	naphthalene	ug/l	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
EPA 8260B	toluene	ug/l	0.5 U	0.5 U	---	0.5 U	0.5 U	---	0.5 U	0.5 U	0.5 U	0.5 U
EPA 8260B	xylenes, total	ug/l	0.5 U	0.5 U	---	0.5 U	0.5 U	---	0.5 U	0.5 U	0.5 U	0.5 U
SW8270D	1,4-dichlorobenzene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	3,3'-dichlorobenzidine	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	bis(2-ethylhexyl) phthalate	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	n-nitrosodi-n-propylamine	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	1-methylnaphthalene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	2-methylnaphthalene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	acenaphthene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	acenaphthylene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	anthracene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	benzo[a]anthracene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	benzo[a]pyrene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	benzo[b]fluoranthene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	benzo[g,h,i]perylene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	benzo[k]fluoranthene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	chrysene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	dibenzo[a,h]anthracene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	fluoranthene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	fluorene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	indeno[1,2,3-c,d]pyrene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	naphthalene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	phenanthrene	ug/l	---	---	---	---	---	---	---	---	---	---
SW8270D	pyrene	ug/l	---	---	---	---	---	---	---	---	---	---

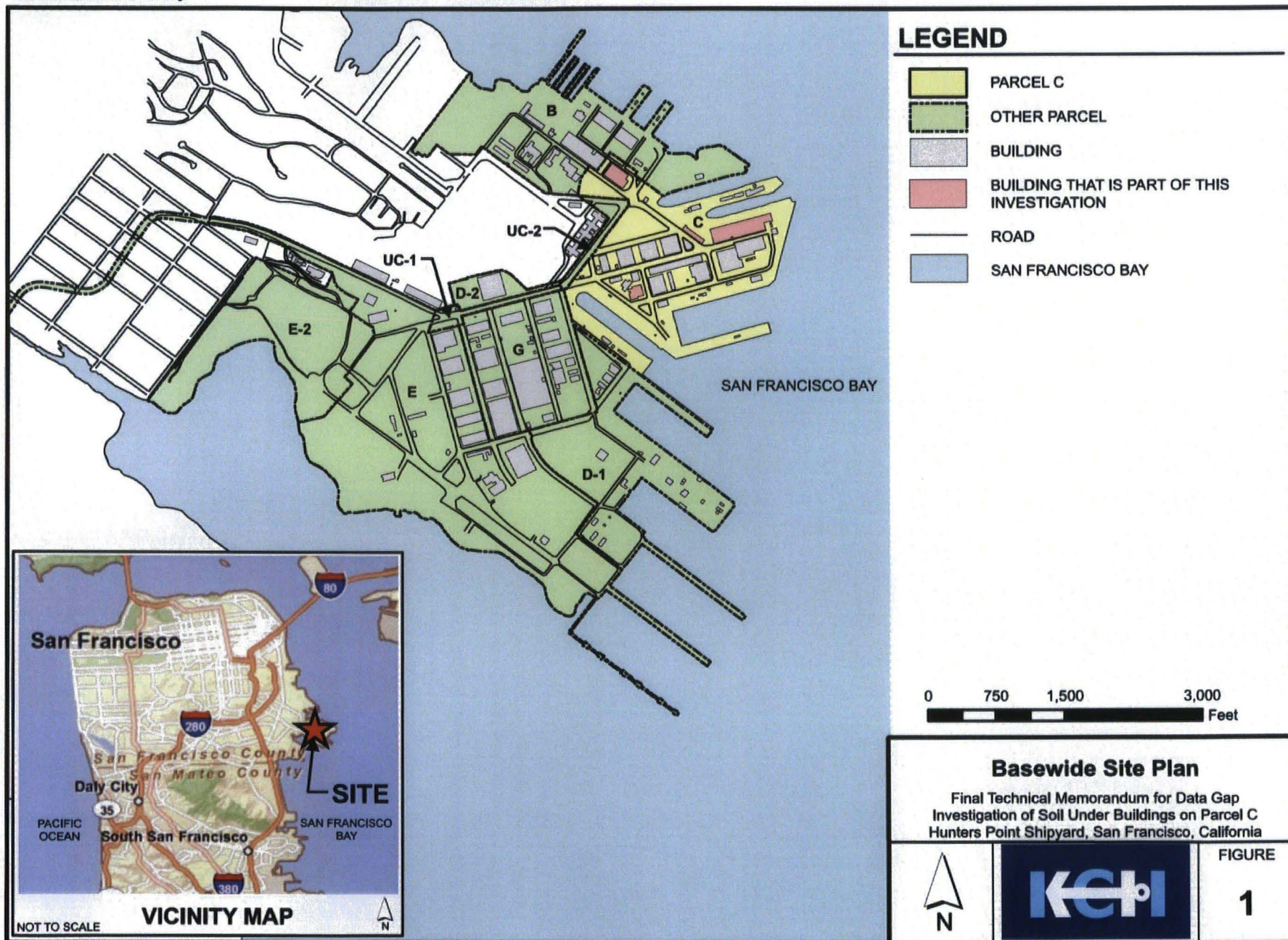
Notes:
BOLD = reported result above the laboratory method detection limit.
--- = chemical not analyzed for this sample

Abbreviations/Acronyms:
DI deionized water
CAP Corrective Action Plan
EB equipment rinsate
EPA U.S. Environmental Protection Agency
HML California Department of Toxic Substances Control
 Hazardous Material Laboratory

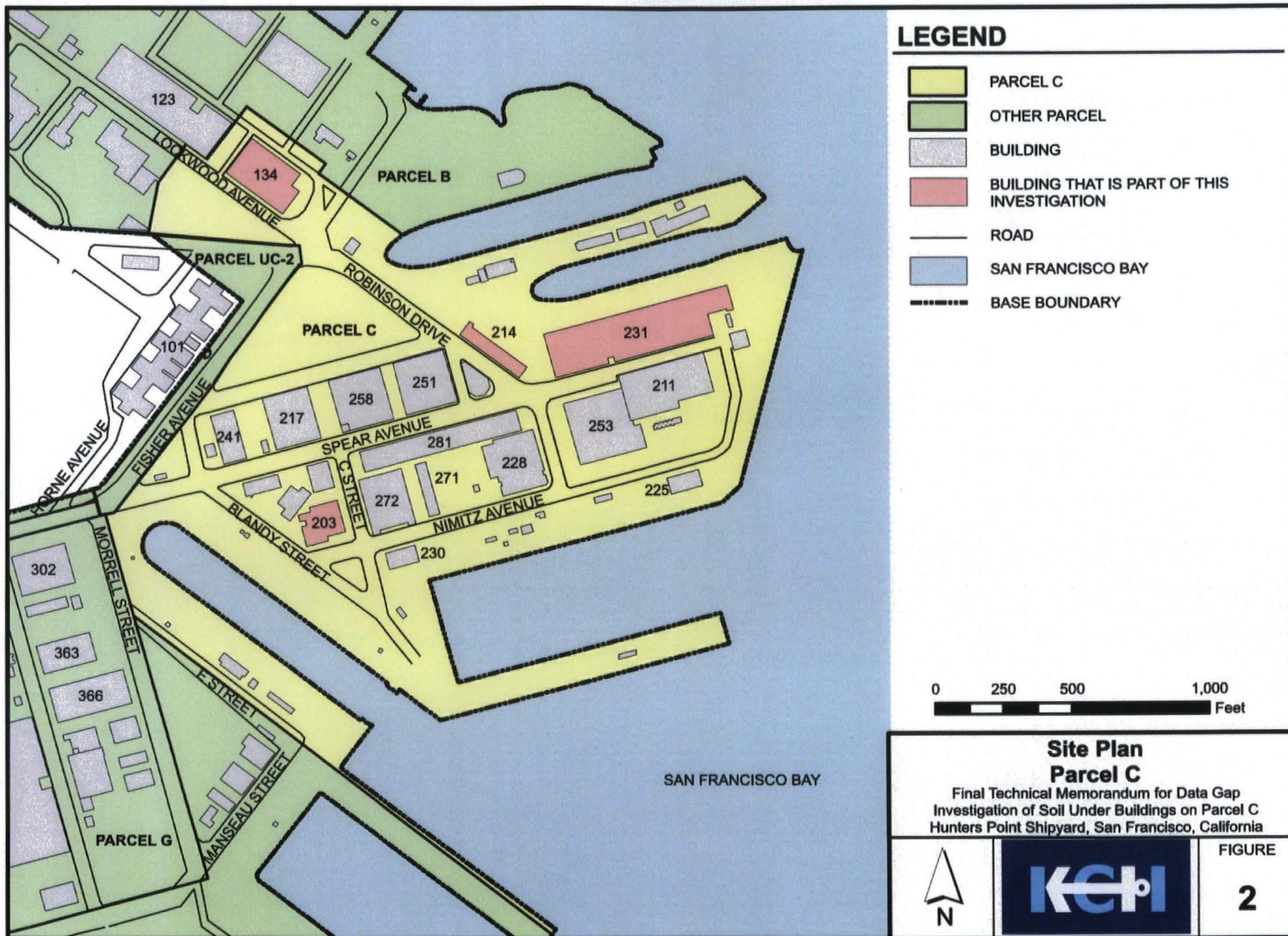
J estimated result
mg/l milligram per liter
NA not applicable
SB source blank
SIM selected ion monitoring
TAP tap water
TB trip blank
TPH total petroleum hydrocarbon
U nondetected result
UJ estimated nondetected result
ug/l microgram per liter

Figures

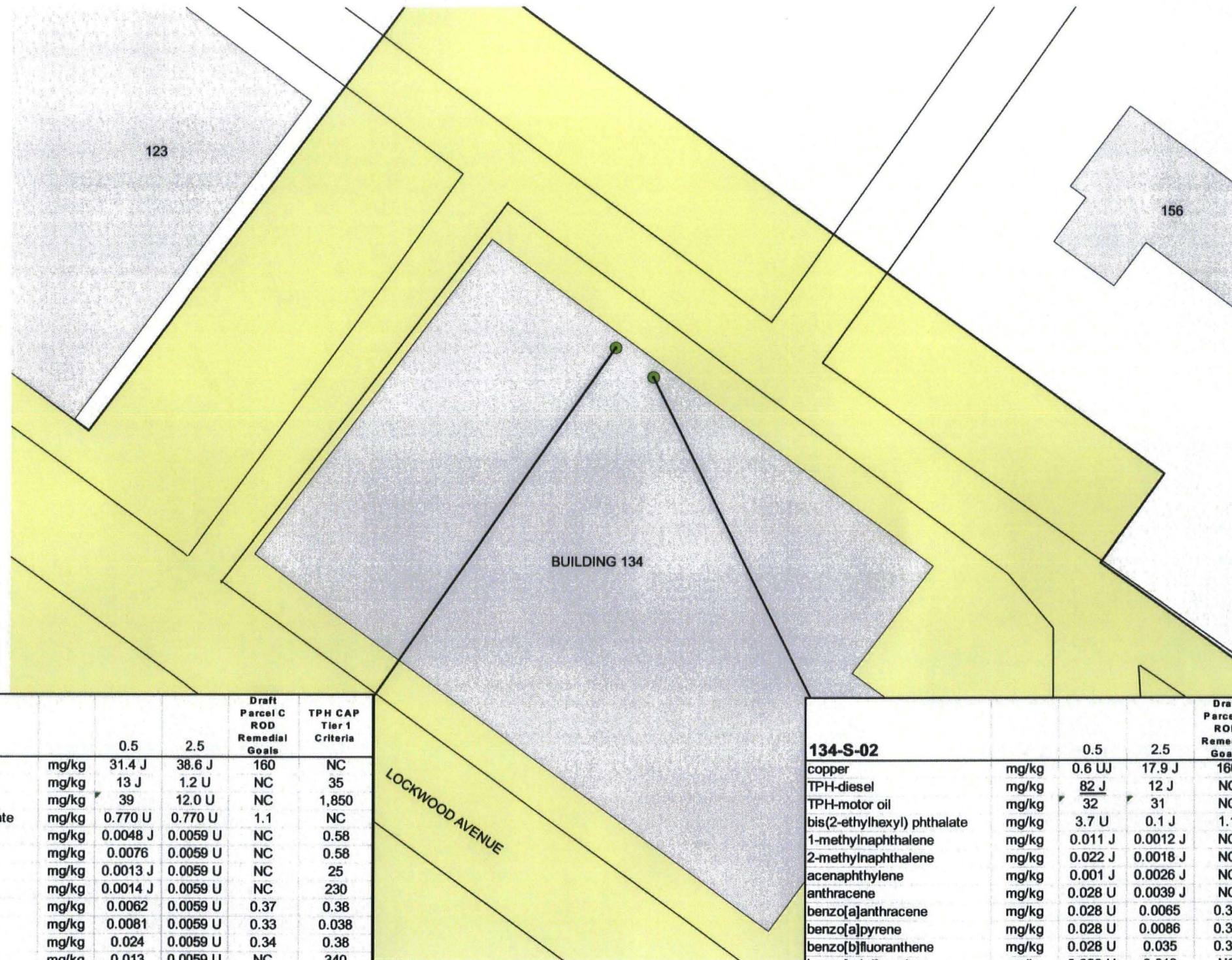
This page intentionally left blank.



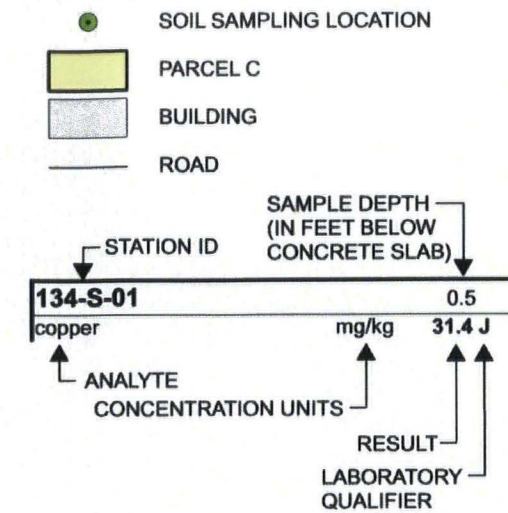
This page intentionally left blank.



This page intentionally left blank.



LEGEND



NOTES:

Soil samples were analyzed for the following:

- Copper
- TPH Gasoline
- TPH Diesel
- TPH Motor oil
- BTEX
- MTBE
- Naphthalene
- SVOCs / PAHs

CAP - Corrective Action Plan

J - estimated result

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

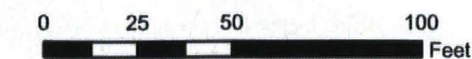
NC - No criteria existing for the compound

ND - not detected above laboratory reporting limits

ROD - Record of Decision

TPH - Total Petroleum Hydrocarbon

Underlined text indicates concentration exceeded TPH CAP Tier 1 criteria



Soil Sampling Locations and Results

Building 134
Final Technical Memorandum for Data Gap
Investigation of Soil Under Buildings on Parcel C
Hunters Point Shipyard, San Francisco, California



FIGURE
3

134-S-01		0.5	2.5	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
copper	mg/kg	31.4 J	38.6 J	160	NC
TPH-diesel	mg/kg	13 J	1.2 U	NC	35
TPH-motor oil	mg/kg	39	12.0 U	NC	1,850
bis(2-ethylhexyl) phthalate	mg/kg	0.770 U	0.770 U	1.1	NC
1-methylnaphthalene	mg/kg	0.0048 J	0.0059 U	NC	0.58
2-methylnaphthalene	mg/kg	0.0076	0.0059 U	NC	0.58
acenaphthylene	mg/kg	0.0013 J	0.0059 U	NC	25
anthracene	mg/kg	0.0014 J	0.0059 U	NC	230
benzo[a]anthracene	mg/kg	0.0062	0.0059 U	0.37	0.38
benzo[a]pyrene	mg/kg	0.0081	0.0059 U	0.33	0.038
benzo[b]fluoranthene	mg/kg	0.024	0.0059 U	0.34	0.38
benzo[g,h,i]perylene	mg/kg	0.013	0.0059 U	NC	340
benzo[k]fluoranthene	mg/kg	0.028	0.0059 U	0.34	0.38
chrysene	mg/kg	0.0098	0.0059 U	3.3	14
dibenzo[a,h]anthracene	mg/kg	0.0032 J	0.0059 U	0.33	NC
fluoranthene	mg/kg	0.0096	0.0059 U	NC	100
fluorene	mg/kg	0.0012 J	0.0059 U	NC	140
indeno[1,2,3-c,d]pyrene	mg/kg	0.0067	0.0059 U	0.35	0.62
naphthalene	mg/kg	0.0031 J	0.0059 U	1.7	0.019
phenanthrene	mg/kg	0.0077	0.0059 U	NC	140
pyrene	mg/kg	0.01	0.0059 U	NC	730

134-S-02		0.5	2.5	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
copper	mg/kg	0.6 UJ	17.9 J	160	NC
TPH-diesel	mg/kg	82 J	12 J	NC	35
TPH-motor oil	mg/kg	32	31	NC	1,850
bis(2-ethylhexyl) phthalate	mg/kg	3.7 U	0.1 J	1.1	NC
1-methylnaphthalene	mg/kg	0.011 J	0.0012 J	NC	0.58
2-methylnaphthalene	mg/kg	0.022 J	0.0018 J	NC	0.58
acenaphthylene	mg/kg	0.001 J	0.0026 J	NC	25
anthracene	mg/kg	0.028 U	0.0039 J	NC	230
benzo[a]anthracene	mg/kg	0.028 U	0.0065	0.37	0.38
benzo[a]pyrene	mg/kg	0.028 U	0.0086	0.33	0.038
benzo[b]fluoranthene	mg/kg	0.028 U	0.035	0.34	0.38
benzo[g,h,i]perylene	mg/kg	0.028 U	0.013	NC	340
benzo[k]fluoranthene	mg/kg	0.028 U	0.038	0.34	0.38
chrysene	mg/kg	0.028 U	0.012	3.3	14
dibenzo[a,h]anthracene	mg/kg	0.028 U	0.0036 J	0.33	NC
fluoranthene	mg/kg	0.028 U	0.01	NC	100
fluorene	mg/kg	0.028 U	0.0056 U	NC	140
indeno[1,2,3-c,d]pyrene	mg/kg	0.028 U	0.0093	0.35	0.62
naphthalene	mg/kg	0.024 J	0.0018 J	1.7	0.019
phenanthrene	mg/kg	0.041	0.0091	NC	140
pyrene	mg/kg	0.028 U	0.013	NC	730

This page intentionally left blank.

		0.5	2.5	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
203-S-01					
acenaphthene	mg/kg	0.005 U	0.0011 J	NC	520
anthracene	mg/kg	0.005 U	0.0021 J	NC	230
benzo[a]anthracene	mg/kg	0.005 U	0.0076	0.37	0.38
benzo[a]pyrene	mg/kg	0.005 U	0.0044 J	0.33	0.038
benzo[b]fluoranthene	mg/kg	0.005 U	0.0098	0.34	0.38
benzo[g,h,i]perylene	mg/kg	0.005 U	0.0026 J	NC	340
benzo[k]fluoranthene	mg/kg	0.005 U	0.011	0.34	0.38
chrysene	mg/kg	0.005 U	0.009	3.3	14
dibenzo[a,h]anthracene	mg/kg	0.005 U	0.001 J	0.33	NC
fluoranthene	mg/kg	0.005 U	0.016	NC	100
indeno[1,2,3-c,d]pyrene	mg/kg	0.005 U	0.0019 J	0.35	0.62
phenanthrene	mg/kg	0.005 U	0.011	NC	140
pyrene	mg/kg	0.005 U	0.014	NC	730

		0.5	2.5	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
203-S-06					
TPH-diesel	mg/kg	1.0 U	9.1 J	NC	35
TPH-motor oil	mg/kg	10.0 U	26	NC	1,850
acenaphthylene	mg/kg	0.0052 U	0.0017 J	NC	25
anthracene	mg/kg	0.00095 J	0.003 J	NC	230
benzo[a]anthracene	mg/kg	0.0087	0.019	0.37	0.38
benzo[a]pyrene	mg/kg	0.0093	0.019	0.33	0.038
benzo[b]fluoranthene	mg/kg	0.015	0.031	0.34	0.38
benzo[g,h,i]perylene	mg/kg	0.0078	0.018	NC	340
benzo[k]fluoranthene	mg/kg	0.016	0.035	0.34	0.38
chrysene	mg/kg	0.0095	0.02	3.3	14
dibenzo[a,h]anthracene	mg/kg	0.0018 J	0.0035 J	0.33	NC
fluoranthene	mg/kg	0.016	0.04	NC	100
indeno[1,2,3-c,d]pyrene	mg/kg	0.0062	0.013	0.35	0.62
naphthalene	mg/kg	0.0052 U	0.0018 J	1.7	0.019
phenanthrene	mg/kg	0.0066	0.018	NC	140
pyrene	mg/kg	0.019	0.051	NC	730

		0.5	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
203-S-08				
manganese	mg/kg	1380	1431	NC

		0.5	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
203-S-07				
aroclor-1260	mg/kg	0.052	0.21	NC

		0.5	2.5	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
203-S-05					
copper	mg/kg	9.8	11.0	160	NC
lead	mg/kg	2.9	6.1 J	155	NC
manganese	mg/kg	309	321 J	1431	NC

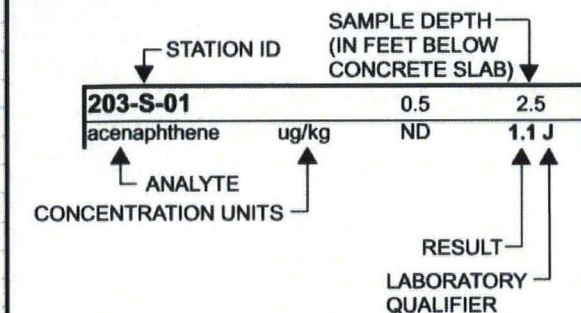
		0.5	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
203-S-02				
copper	mg/kg	40.4 J	160	NC
manganese	mg/kg	1150 J	1,431	NC
mercury	mg/kg	0.22	2.28	NC
1-methylnaphthalene	mg/kg	0.002 J	NC	1
2-methylnaphthalene	mg/kg	0.0027 J	NC	1
acenaphthene	mg/kg	0.0012 J	NC	520
anthracene	mg/kg	0.0028 J	NC	230
benzo[a]anthracene	mg/kg	0.015	0.37	0.38
benzo[a]pyrene	mg/kg	0.014	0.33	0.038
benzo[b]fluoranthene	mg/kg	0.029	0.34	0.38
benzo[g,h,i]perylene	mg/kg	0.012	NC	340
benzo[k]fluoranthene	mg/kg	0.033	0.34	0.38
chrysene	mg/kg	0.019	3.3	14
dibenzo[a,h]anthracene	mg/kg	0.0031 J	0.33	NC
fluoranthene	mg/kg	0.024	NC	100
fluorene	mg/kg	0.0012 J	NC	140
indeno[1,2,3-c,d]pyrene	mg/kg	0.008	0.35	0.62
naphthalene	mg/kg	0.0023 J	1.70	0.019
phenanthrene	mg/kg	0.015	NC	140
pyrene	mg/kg	0.025	NC	730

		0.5	2.5	4.5	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
203-S-03						
organic lead	mg/kg	0.198	0.00908 J	ND	0.5	NC
copper	mg/kg	22.8 J	16.9 J	ND	160	NC
aroclor-1260	mg/kg	0.12 J	ND	ND	0.21	NC

		0.5	2.5	4.5	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
203-S-04						
bis(2-ethylhexyl) phthalate	mg/kg	0.68 U	0.12 J	0.19 J	1.1	NC
1-methylnaphthalene	mg/kg	0.0013 J	0.0019 J	0.0063	NC	0.58
2-methylnaphthalene	mg/kg	0.0031 J	0.0049 J	0.0075	NC	0.58
acenaphthylene	mg/kg	0.00099 J	0.00093 J	0.0014 J	NC	25
anthracene	mg/kg	0.0013 J	0.001 J	0.0011 J	NC	230
benzo[a]anthracene	mg/kg	0.008	0.0058	0.0074	0.37	0.38
benzo[a]pyrene	mg/kg	0.0083	0.0055	0.011	0.33	0.038
benzo[b]fluoranthene	mg/kg	0.017	0.016	0.019	0.34	0.38
benzo[g,h,i]perylene	mg/kg	0.0089	0.0074	0.014	NC	340
benzo[k]fluoranthene	mg/kg	0.018	0.017	0.021	0.34	0.38
chrysene	mg/kg	0.013	0.01	0.012	3.3	14
dibenzo[a,h]anthracene	mg/kg	0.0018 J	0.0016 J	0.0019 J	0.33	NC
fluoranthene	mg/kg	0.018	0.013	0.027	NC	100
indeno[1,2,3-c,d]pyrene	mg/kg	0.0067	0.005 J	0.0094	0.35	0.62
naphthalene	mg/kg	0.0025 J	0.0027 J	0.016	1.7	0.019
phenanthrene	mg/kg	0.01	0.0067	0.014	NC	140
pyrene	mg/kg	0.022	0.013	0.032	NC	730

LEGEND

- SOIL SAMPLING LOCATION
- PARCEL C
- BUILDING
- ROAD



NOTES:

Soil samples were analyzed for the following:

Manganese TPH Motor oil
Lead PCBs (Aroclor-1260)
Copper BTEX
Organic lead Naphthalene
Mercury SVOCs / PAHs
TPH Diesel

CAP - Corrective Action Plan

J - estimated result

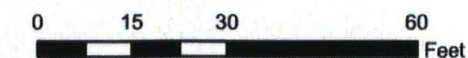
ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

NC - No criteria existing for the compound

ND - not detected above laboratory reporting limits

TPH - Total Petroleum Hydrocarbon



Soil Sampling Locations and Results Building 203

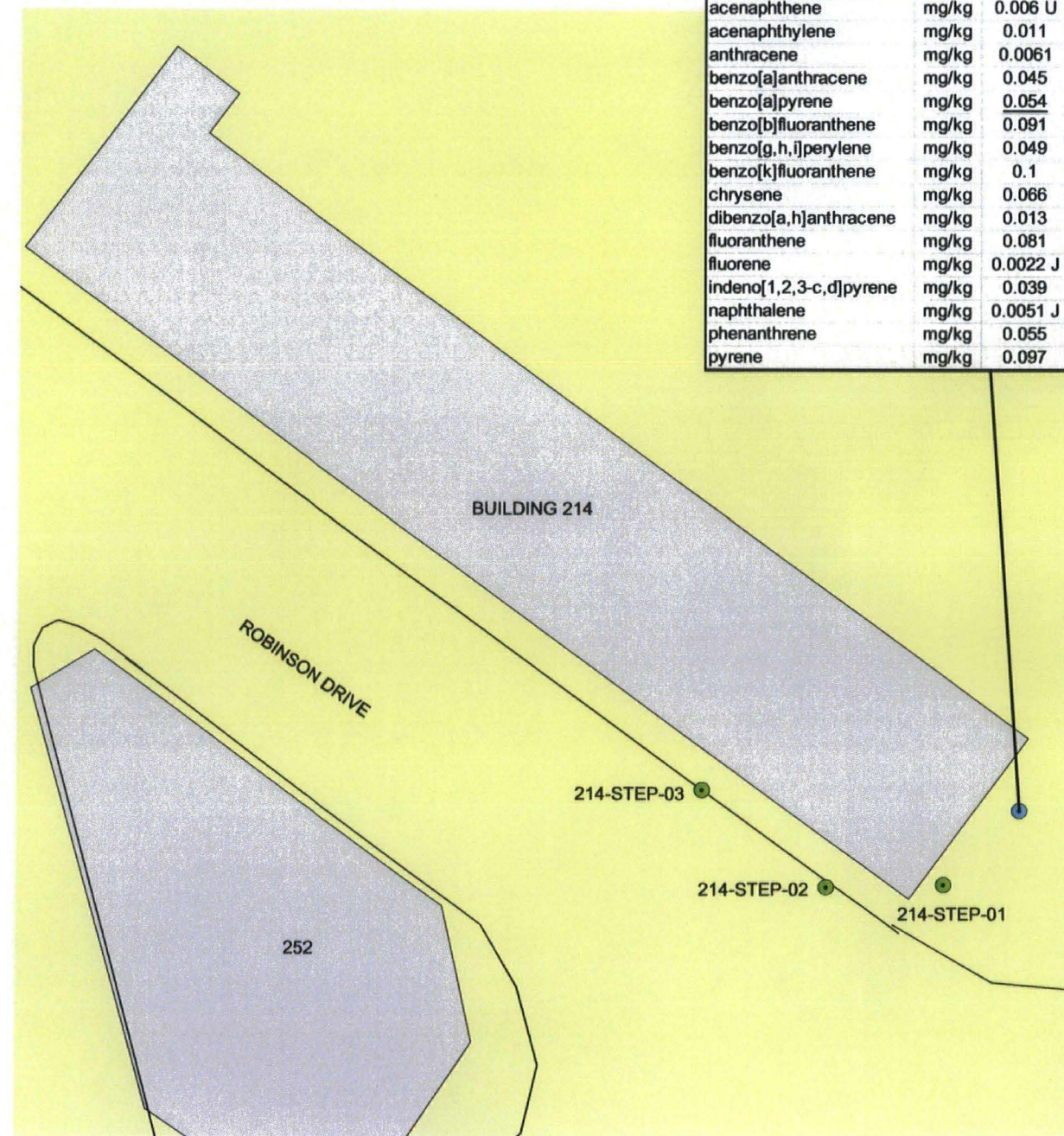
Final Technical Memorandum for Data Gap
Investigation of Soil Under Buildings on Parcel C
Hunters Point Shipyard, San Francisco, California



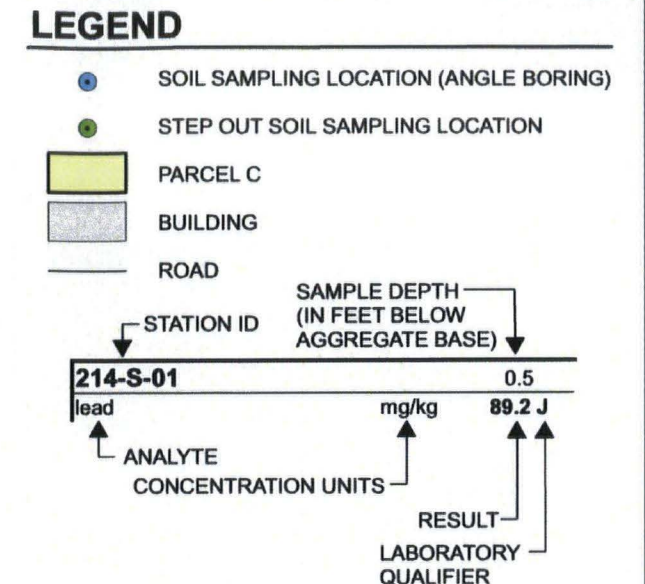
FIGURE

4

This page intentionally left blank.



214-S-01		0.4	2.2	3.9	5.6	7.4	8.2	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
lead	mg/kg	89.2 J	0.6 UJ	43.7 J	16.9 J	66.9 J	5.8 J	155	NC
bis(2-ethylhexyl) phthalate	mg/kg	0.21 J	0.13 J	0.17 J	0.19 J	0.18 J	0.77 U	1.1	NC
1-methylnaphthalene	mg/kg	0.0024 J	0.0062 U	0.017	0.033	0.0015 J	0.0058 U	NC	0.58
2-methylnaphthalene	mg/kg	0.0047 J	0.0062 U	0.026	0.037	0.0033 J	0.0058 U	NC	0.58
acenaphthene	mg/kg	0.006 U	0.0062 U	0.012	0.017	0.0015 J	0.0058 U	NC	520
acenaphthylene	mg/kg	0.011	0.0062 U	0.074	0.15	0.017	0.0058 U	NC	25
anthracene	mg/kg	0.0061	0.0062 U	0.2	0.37	0.045	0.0058 U	NC	230
benzo[a]anthracene	mg/kg	0.045	0.0062 U	1.1	1.2	0.16	0.0026 J	0.37	0.38
benzo[a]pyrene	mg/kg	0.054	0.0062 U	0.87	0.99	0.15	0.0022 J	0.33	0.038
benzo[b]fluoranthene	mg/kg	0.091	0.0062 U	1.3	1.6	0.22	0.0048 J	0.34	0.38
benzo[g,h,i]perylene	mg/kg	0.049	0.0062 U	0.69	0.55	0.094	0.0058 U	NC	340
benzo[k]fluoranthene	mg/kg	0.1	0.0062 U	1.5	1.7	0.26	0.0034 J	0.340	0.38
chrysene	mg/kg	0.066	0.0062 U	1.1	1.2	0.16	0.0019 J	3.3	14
dibenzo[a,h]anthracene	mg/kg	0.013	0.0062 U	0.22	0.18	0.027	0.0058 U	0.33	NC
fluoranthene	mg/kg	0.081	0.0062 U	1.5	2	0.23	0.0027 J	NC	100
fluorene	mg/kg	0.0022 J	0.0062 U	0.046	0.11	0.0092	0.0058 U	NC	140
indeno[1,2,3-c,d]pyrene	mg/kg	0.039	0.0062 U	0.67	0.55	0.083	0.0058 U	0.35	0.62
naphthalene	mg/kg	0.0051 J	0.0062 U	0.052	0.059	0.0088	0.0058 U	1.7	0.019
phenanthrene	mg/kg	0.055	0.0062 U	1	1.7	0.11	0.0013 J	NC	140
pyrene	mg/kg	0.097	0.0062 U	1.7	2.3	0.29	0.0028 J	NC	730



NOTES:

Borehole 214-S-01 was advanced at an angle of approximately 30 degrees to vertical

The sample depths have been adjusted for the angle at which the boring was advanced

Soil samples were analyzed for one or more of the following:

Lead
SVOCs / PAHs

CAP - Corrective Action Plan

J - estimated result

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

NC - No criteria existing for the compound

ND - not detected above laboratory reporting limits

TPH - Total Petroleum Hydrocarbon

ROD - Record of Decision



Underlined text indicates concentration exceeded TPH CAP Tier 1 criteria

Bold text indicates concentration exceeded the Parcel C ROD criteria

0 20 40 80 Feet

Soil Sampling Locations and Results Building 214

Final Technical Memorandum for Data Gap Investigation of Soil Under Buildings on Parcel C Hunters Point Shipyard, San Francisco, California

  **FIGURE 5a**

This page intentionally left blank.

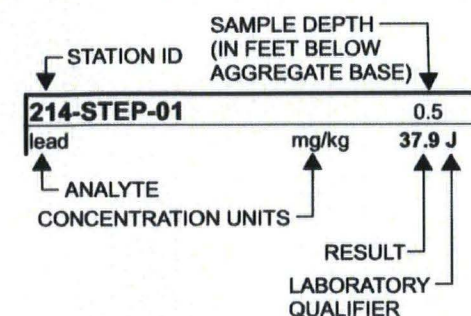
214-STEP-03		0.5	2.5	4.5	6.5	8.5	9.5	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
lead	mg/kg	32.6 J	55.7 J	29.2 J	44.7 J	31.9 J	8.0 J	155	NC
bis(2-ethylhexyl) phthalate	mg/kg	0.001 J	0.78 U	0.28 J	0.65 J	0.77 U	0.73 U	1.1	NC
1-methylnaphthalene	mg/kg	0.028 U	0.0059 U	0.0013 J	0.0059 U	0.0058 U	0.0055 U	NC	0.58
2-methylnaphthalene	mg/kg	0.028 U	0.0059 U	0.0019 J	0.0059 U	0.0058 U	0.0055 U	NC	0.58
acenaphthene	mg/kg	0.028 U	0.0059 U	0.0058 U	0.0011 J	0.0058 U	0.0055 U	NC	520
acenaphthylene	mg/kg	0.028 U	0.0059 U	0.006	0.0029 J	0.0011 J	0.0055 U	NC	25
anthracene	mg/kg	0.0083 J	0.0015 J	0.0094	0.0043 J	0.0014 J	0.0055 U	NC	230
benzo[a]anthracene	mg/kg	0.047	0.0084	0.082	0.073	0.011	0.0027 J	0.37	0.38
benzo[a]pyrene	mg/kg	<u>0.045</u>	0.0089	<u>0.083</u>	<u>0.094</u>	0.011	0.0055 U	0.33	0.038
benzo[b]fluoranthene	mg/kg	0.087	0.012	0.13	0.14	0.014	0.0055 U	0.34	0.38
benzo[g,h,i]perylene	mg/kg	0.081	0.0098	0.094	0.096	0.0094	0.0055 U	NC	340
benzo[k]fluoranthene	mg/kg	0.017 J	4.2 J	0.028	0.026	0.0054 J	0.0055 U	0.34	0.38
chrysene	mg/kg	0.098	0.0066	0.065	0.051	0.0095	0.0015 J	3.3	14
dibenzo[a,h]anthracene	mg/kg	0.021 J	0.002 J	0.021	0.02	0.0029 J	0.0055 U	0.33	NC
fluoranthene	mg/kg	0.091	0.012	0.082	0.071	0.016	0.003 J	NC	100
indeno[1,2,3-c,d]pyrene	mg/kg	0.037	0.0082	0.078	0.083	0.0085	0.0055 U	0.35	0.62
naphthalene	mg/kg	0.028 U	0.0059 U	0.0025 J	0.0059 U	0.0058 U	0.0055 U	1.7	0.019
phenanthrene	mg/kg	0.055	0.0049 J	0.038	0.022	0.0068	0.0021 J	NC	140
pyrene	mg/kg	0.065	0.012	0.076	0.056	0.014	0.0029 J	NC	730

214-STEP-02		0.5	2.5	4.5	6.5	8.5	9.5	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
lead	mg/kg	61.7 J	42.5 J	5.8 J	85.5 J	40.1 J	49.0 J	155	NC
acenaphthene	mg/kg	0.026 U	0.0016 J	0.0058 U	0.006 U	0.0062 U	0.0067 U	NC	520
acenaphthylene	mg/kg	0.0049 J	0.0017 J	0.0058 U	0.006 U	0.0062 U	0.0013 J	NC	25
anthracene	mg/kg	0.026 U	0.0046 J	0.0058 U	0.006 U	0.0062 U	0.0067 U	NC	230
benzo[a]anthracene	mg/kg	0.021 J	0.026	0.0026 J	0.0052 J	0.0043 J	0.0045 J	0.37	0.38
benzo[a]pyrene	mg/kg	0.034	0.022	0.0022 J	0.004 J	0.0038 J	0.0041 J	0.33	0.038
benzo[b]fluoranthene	mg/kg	0.048	0.033	0.0048 J	0.0075	0.0067	0.0074	0.34	0.38
benzo[g,h,i]perylene	mg/kg	0.11	0.025	0.0058 U	0.0045 J	0.0035 J	0.0037 J	NC	340
benzo[k]fluoranthene	mg/kg	0.0059 J	0.008	0.0034 J	0.0058 J	0.0051 J	0.0056 J	0.34	0.38
chrysene	mg/kg	0.056	0.018	0.0019 J	0.0045 J	0.0036 J	0.0045 J	3	14
dibenzo[a,h]anthracene	mg/kg	0.032	0.0065	0.0058 U	0.0013 J	0.0014 J	0.0067 U	0.33	NC
fluoranthene	mg/kg	0.024 J	0.044	0.0027 J	0.0068	0.006 J	0.008	NC	100
indeno[1,2,3-c,d]pyrene	mg/kg	0.029	0.017	0.0058 U	0.0028 J	0.0031 J	0.0032 J	0.35	0.62
phenanthrene	mg/kg	0.017 J	0.024	0.0013 J	0.0039 J	0.0032 J	0.0067	NC	140
pyrene	mg/kg	0.023 J	0.035	0.0028 J	0.0072	0.0058 J	0.0081	NC	730

214-STEP-01		0.5	2.5	4.5	6.5	8.5	9.5	Draft Parcel C ROD Remedial Goals	TPH CAP Tier 1 Criteria
lead	mg/kg	37.9 J	12.7 J	123 J	80.0 J	19.2 J	19.7 J	155	NC
1-methylnaphthalene	mg/kg	0.0056 U	0.0058 U	0.0065 U	0.0013 J	0.0063 U	0.0018 J	NC	0.58
2-methylnaphthalene	mg/kg	0.0013 J	0.0058 U	0.0065 U	0.0014 J	0.0063 U	0.0021 J	NC	0.58
acenaphthylene	mg/kg	0.0039 J	0.0031 J	0.0018 J	0.003 J	0.0033 J	0.01	NC	25
anthracene	mg/kg	0.0035 J	0.0021 J	0.002 J	0.0026 J	0.0029 J	0.0058 J	NC	230
benzo[a]anthracene	mg/kg	0.029	0.016	0.015	0.021	0.023	0.055	0.37	0.38
benzo[a]pyrene	mg/kg	0.029	0.015	0.014	0.02	0.02	<u>0.055</u>	0.33	0.038
benzo[b]fluoranthene	mg/kg	0.041	0.022	0.019	0.026	0.029	0.079	0.34	0.38
benzo[g,h,i]perylene	mg/kg	0.03	0.03	0.012	0.024	0.014	0.049	NC	340
benzo[k]fluoranthene	mg/kg	0.011	0.0064	0.0065	0.0077	0.0092	0.02	0.340	0.38
chrysene	mg/kg	0.023	0.014	0.012	0.018	0.018	0.046	3.3	14
dibenzo[a,h]anthracene	mg/kg	0.0069	0.0068	0.0033 J	0.0048 J	0.0043 J	0.012	0.33	NC
fluoranthene	mg/kg	0.05	0.032	0.026	0.037	0.042	0.071	NC	100
indeno[1,2,3-c,d]pyrene	mg/kg	0.024	0.017	0.012	0.015	0.014	0.045	0.35	0.62
naphthalene	mg/kg	0.0025 J	0.0017 J	0.0065 U	0.0011 J	0.0015 J	0.0022 J	1.7	0.019
phenanthrene	mg/kg	0.02	0.018	0.0088	0.021	0.016	0.025	NC	140
pyrene	mg/kg	0.041	0.03	0.022	0.035	0.032	0.07	NC	730

LEGEND

- SOIL SAMPLING LOCATION (ANGLE BORING)
- STEP OUT SOIL SAMPLING LOCATION
- PARCEL C
- BUILDING
- ROAD



NOTES:

Boreholes were advanced vertically

Soil samples were analyzed for one or more of the following:

Lead
SVOCs / PAHs

CAP - Corrective Action Plan

J - estimated result

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

NC - No criteria existing for the compound

ND - not detected above laboratory reporting limits

TPH - Total Petroleum Hydrocarbon

Underlined text indicates concentration exceeded TPH CAP Tier 1 criteria

0 20 40 80
Feet

Step Out Soil Sampling Locations and Results, Building 214

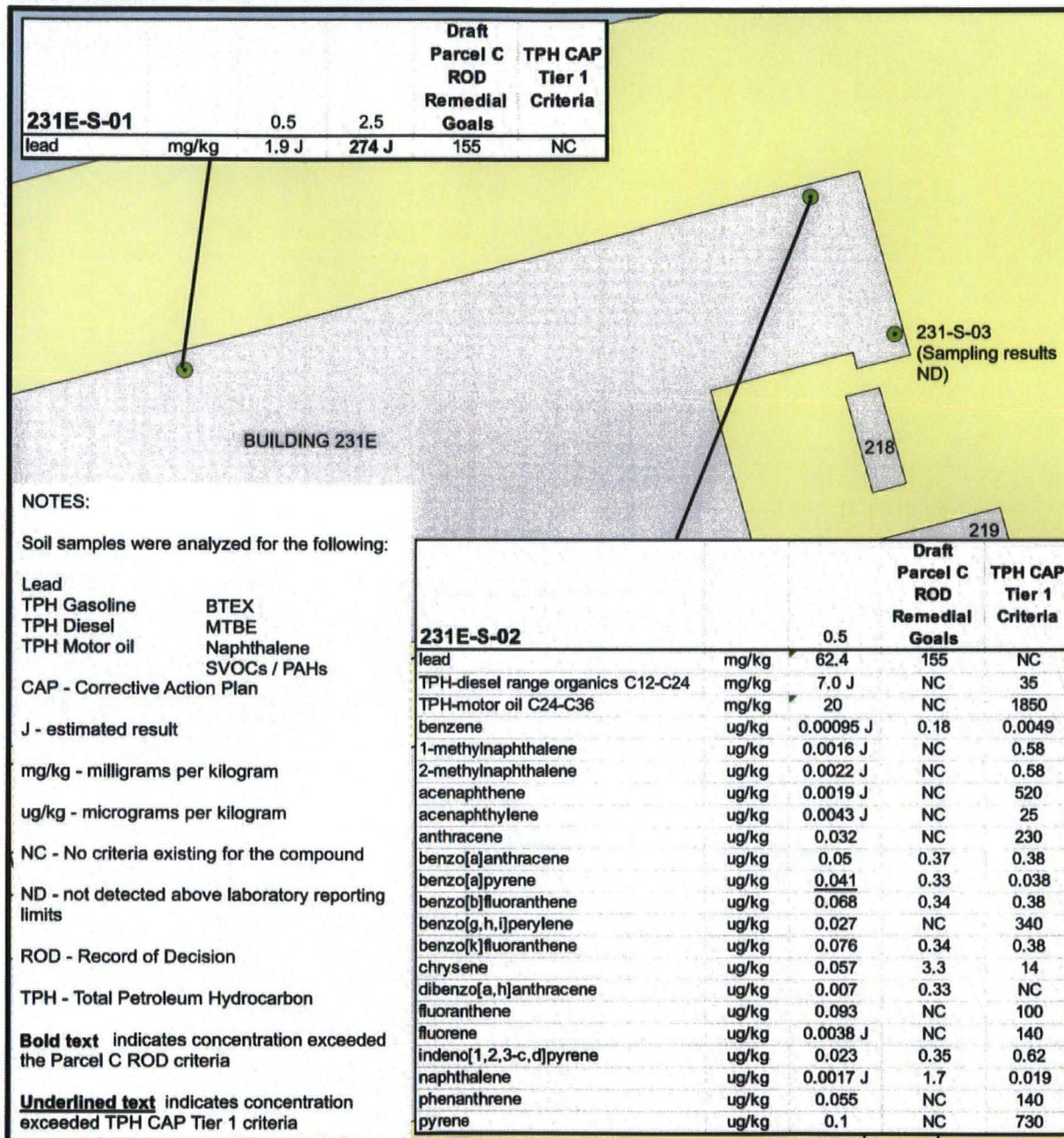
Final Technical Memorandum for Data Gap
Investigation of Soil Under Buildings on Parcel C
Hunters Point Shipyard, San Francisco, California



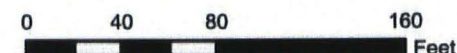
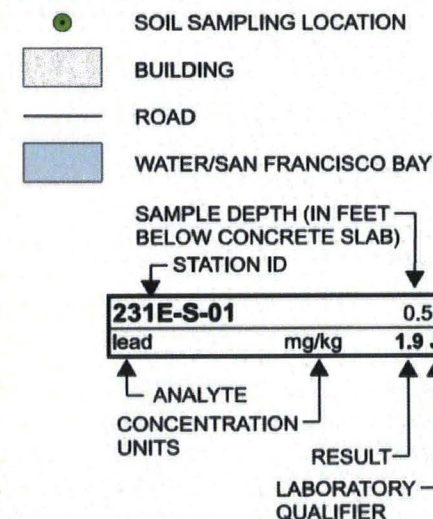
FIGURE

5b

This page intentionally left blank.



LEGEND



Soil Sampling Locations and Results

Building 231E

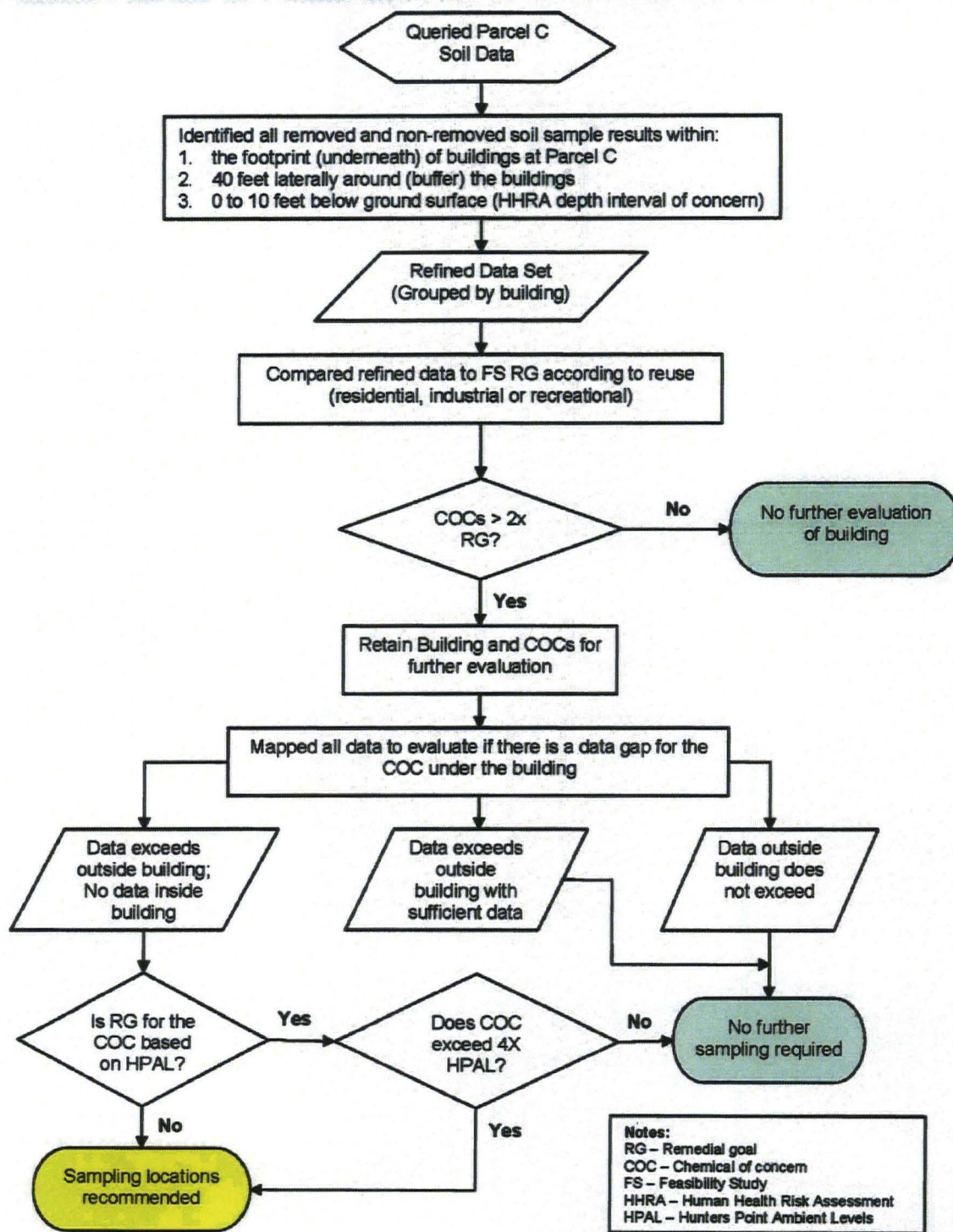
Final Technical Memorandum for Data Gap
Investigation of Soil Under Buildings on Parcel C
Hunters Point Shipyard, San Francisco, California



FIGURE

6

This page intentionally left blank.



Decision Tree for Evaluation of Soil Data Under Parcel C Buildings
 Final Technical Memorandum for Data Gap
 Investigation of Soil Under Buildings on Parcel C
 Hunters Point Shipyard, San Francisco, California



FIGURE

7

This page intentionally left blank.

Appendix A

Personnel Signoff Sheets

This page intentionally left blank.

Final Project-Specific Sampling and Analysis Plan
Site Name: Hunters Point Shipyard
Site Location: San Francisco, California

Title: Data Gaps Investigation of Soil Under Buildings on Parcel C
Document Control Number: KCH-2622-0003-0015
Revision Date: December 8, 2009

SAP Worksheet #4 -- Project Personnel Sign-Off Sheet

Name	Organization/Title/Role	Telephone Number (optional)	Signature/email receipt	SAP Section Reviewed	Date SAP Read
Sarah Koppel	Navy / RPM	(619) 532- 0962			
Dana Sakamoto	CH2M HILL Kleinfelder JV / Program Manager	(619) 687-0116			
Leslie Lundgren	Team Manager	(619) 687-0116			
Mohammad Abri	CH2M HILL Kleinfelder JV / Project QAO	(925) 373-9606			
Patricia Walters	CH2M HILL Kleinfelder JV / Project Chemist	(510) 628-9000	Patricia Walters	Complete SAP	1/6/10
Gerald Kellar	CH2M HILL Kleinfelder JV / Data Manager	(858) 320-2000			
Diane Anderson	APPL / Project Manager	(559) 275-2175			
Steve Lane	CalScience Environmental Laboratories, Inc.	(714) 895-5494			
Maxine Walters	Data Validation Subcontractor	(412) 341-5281			
Gabe Fuson	CH2M HILL Kleinfelder JV / Field Manager	(510) 628-9000	Gabe Fuson	complete SAP	01/13/2010
To Be Determined	CH2M HILL Kleinfelder JV / Sampling personnel	Not applicable	Jeff Graveson Nathan Berner William Delaney	Worksheets #12, 14, 17, 18A, 18B, 19, 27	1/6/10

Notes:

The sampling personnel read the appropriate sections of this document before performing activities related to this SAP. The completed Worksheet is maintained in the CH2M HILL Kleinfelder JV project file.

This page intentionally left blank.

Appendix B
Summary of Selection Process for Additional Soil Removal
Areas Identified in Parcel C

This page intentionally left blank.

APPENDIX B

Summary of Selection Process for Additional Soil Removal Areas Identified in Parcel C

The Department of the Navy (Navy) conducted a comprehensive evaluation of soil chemical analysis data in the vicinity of existing buildings at Parcel C of Hunters Point Shipyard in 2009, to address BCT concerns that chemicals of concern (COCs) may not be adequately characterized beneath the buildings at Parcel C. To address this concern, the Navy conducted a comprehensive database and GIS evaluation of all removed and non-removed soil analytical results for all COCs within a 40-foot buffer of the buildings and including the footprint of the buildings, to a depth of 10 feet below ground surface. The evaluation was conducted as a step-wise screening process as shown in **Figure B-1**. Soil analytical results were compared to the applicable remedial goals for the redevelopment block. For buildings where at least one COC exceeded the applicable remediation goal by a factor of two or more, the building was retained for further detailed evaluation. Initially, a total of 12 buildings (Buildings 134, 203, 217, 231E, 231W, 241, 251, 253, 258, 272, 275 and 281) were retained for detailed evaluation. Building 214 was later added, for a total of 13 buildings which were evaluated in detail. The evaluation entailed spatial evaluation of soil analytical results within each building and in the perimeter of the building, to determine if soil contamination was adequately bounded beneath the building footprint. Based on the detailed evaluation, the Navy recommended additional soil sampling within the footprint of Buildings 134, 203, 214, and the eastern portion of Building 231.

A meeting was held on May 27, 2009 between the Navy, U.S. Environmental Protection Agency (USEPA), California Department of Toxic Substances Control (DTSC), California Regional Water Quality Control Board, San Francisco Bay Region (Water Board), and City and County of San Francisco in Oakland, California to discuss the evaluation data set for the 13 buildings, and Navy's recommendation for additional data gap sampling within four of the buildings. The following agreements were reached as a result of this meeting:

- The Navy will conduct a soil data gap investigation beneath Buildings 134, 203, 214 and eastern portion of Building 231 as follows:
 - Two soil borings within Building 134, to collect soil samples for copper and polynuclear aromatic hydrocarbons (PAHs)
 - Eight soil borings within Building 203, to collect soil samples for copper, lead, manganese, mercury, organic lead, naphthalene, PAHs, Aroclor-1260, total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene and xylenes (BTEX)
 - One soil boring within Building 214, to collect soil samples for lead and PAHs

- Three soil borings within the eastern portion of Building 231, to collect soil samples for lead and PAHs.
- While the building foundations serve as adequate cover remedy throughout Parcel C, the footprint of Buildings 134, 272 and 281, and the western portion of Building 231 are designated as areas requiring institutional controls (ARICs) where further action such as additional investigation and/or remedy will be required if the foundation is to be removed or modified in the future. The footprint of Buildings 203, 214 and 231 may also be designated as ARICs depending on the results of the soil data gap investigation.
- The Navy will conduct a soil investigation to address the data gap prior to issuing the draft record of decision. The Navy will develop a sampling and analysis plan for agency review and approval.

During the process of evaluating the need for additional soil sampling under the buildings, the Navy and the agencies also reviewed the adequacy of proposed removal areas within the footprint of, or adjacent to, the 13 buildings evaluated in detail. The Navy and the agencies agreed to the following adjustments to increase the area of two excavations (20A-1 and 24-4) in Parcel C as follows:

- Excavation 20A-1 (Building 258): Expand excavation area to include removal of adjacent sample locations 280601W3D (zinc) and 280601W3C (PAHs).
- Excavation 24-4 (Building 272): Expand excavation area to include removal of adjacent sample location 280301W9B (manganese).

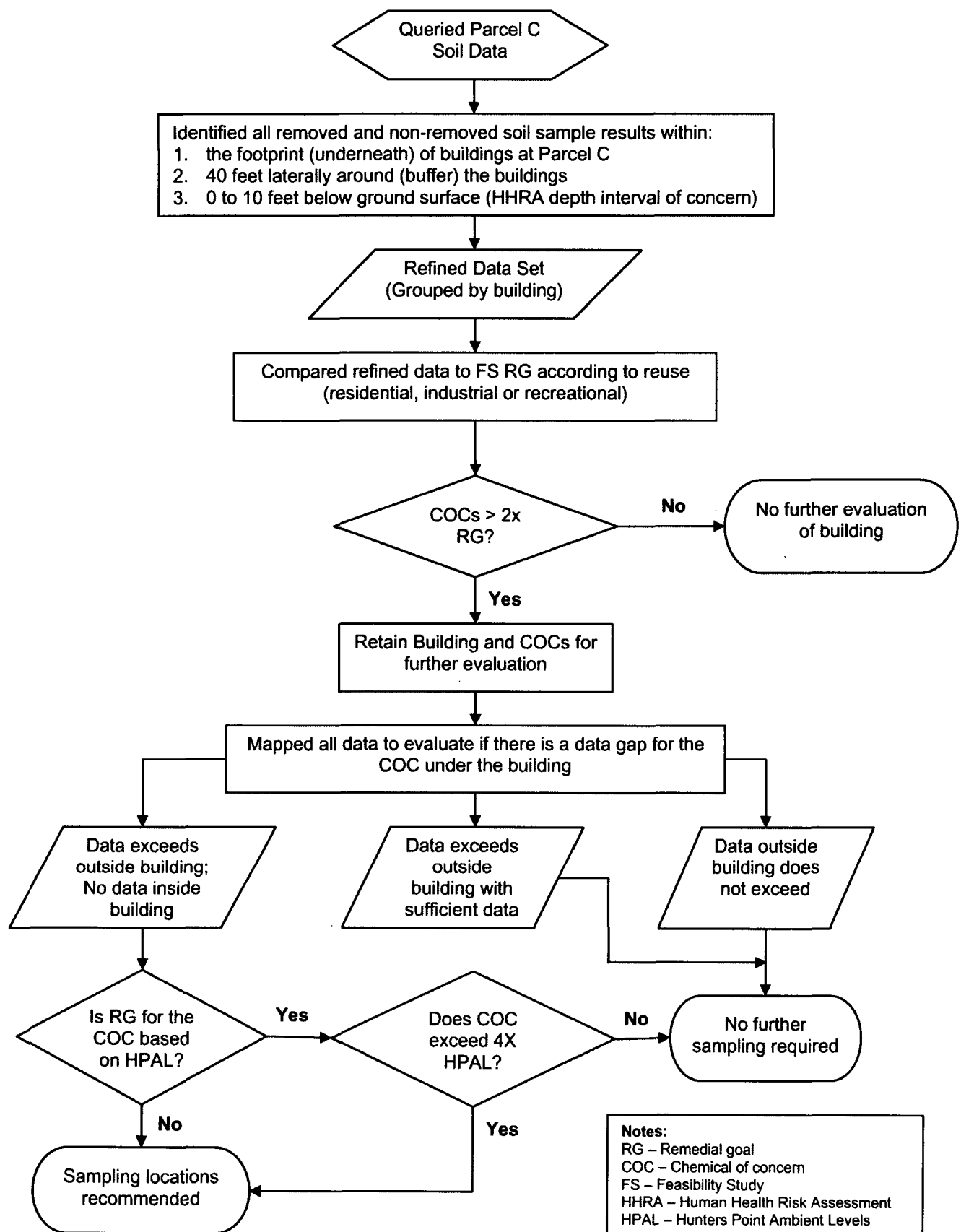
The changes to the excavation footprint of Excavations 20A-1 and 24-4 are shown in **Figure B-2** and in Figure 10 of the Draft Parcel C Record of Decision (ChaduxTt, 2010).

The Navy issued the Final Work Plan and Sampling and Analysis Plan for the data gap investigation in December 2009 (CH2M HILL Kleinfelder [KCH], 2009a; 2009b). The field work was completed in January and February 2010.

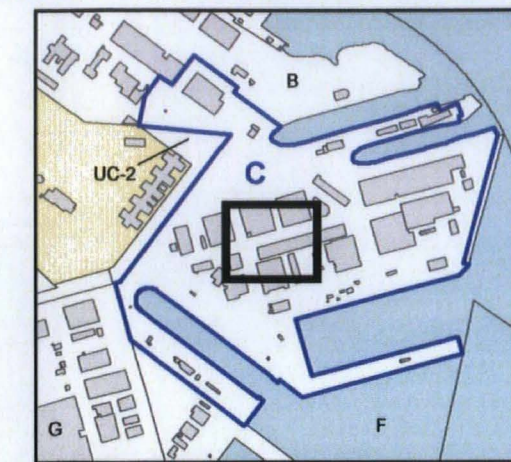
References:

- CH2M HILL Kleinfelder (KCH). 2009a. Final Work Plan Data Gap Investigation of Soil Under Buildings on Parcel C, Hunters Point Shipyard, San Francisco, California. December.
- CH2M HILL Kleinfelder (KCH). 2009b. Final Sampling and Analysis Plan (Field Sampling Plan and Quality Assurance Project Plan) for Data Gaps Investigation of Soil Under Buildings on Parcel C. December.
- ChaduxTt. 2010. Draft Record of Decision for Parcel C, Hunters Point Shipyard, San Francisco, California. April.

FIGURE B-1: DECISION TREE FOR EVALUATION OF SOIL DATA UNDER PARCEL C BUILDINGS
 EVALUATION OF SOIL UNDER BUILDING COVER, PARCEL C, HUNTERS POINT SHIPYARD



This page intentionally left blank.



- Selected Soil Sampling Location
- ▭ Proposed Excavation Area
- ▭ Revised Proposed Excavation Area
- ▨ Area Requiring Institutional Control*
- ▭ Proposed SVE Area
- Non-Navy Property
- Road Edge
- Proposed Surface Covers and Soil Remedies**
 - ▭ New Asphalt
 - ▭ Repaired Asphalt
 - ▭ Building Footprint (with building number)

Note:
 *Selected remedy for these areas is to maintain building footprints (foundations) to serve as surface covers. If the buildings are removed in the future, further action is required to address chemicals present in soil beneath the building footprint.

SVE Soil Vapor Extraction



Hunters Point Shipyard, San Francisco, California
 Department of the Navy, BRAC PMO West, San Diego, CA

FIGURE B-2
REVISED EXCAVATION
FOOTPRINTS IN PARCEL C

This page intentionally left blank.

Appendix C

Borehole Logs

This page intentionally left blank.

Date Started: 1/8/10 Date Completed: 1/8/10 Location: Building 134
 Logged By: W. Uchiyama Drilling method: Hand Auger
 Reviewed By: T. Sayre Hammer Wt: None
 Total Depth: 4.2 ft Surface Conditions: 6.5" Concrete
 Latitude: -122.38388 Surface Elevation: Estimated 14
 Longitude: 37.72882

Depth (feet)	Sample Number Time	Sample Type	Blows/foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1002W002 Time: 11:10	<input checked="" type="checkbox"/>			0.5		FILL, CLAYEY SAND (SC) - brown, moist, with gravel, with cobbles - hit asphalt pieces - hit obstruction	Depths measured from bottom of concrete slab.
2								
3	1002W005 Time: 10:23	<input checked="" type="checkbox"/>			0.0		CLAYEY SILT with SAND (ML) - dark brown, with cobbles - gray - wet	∇
4	1/8/10							
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

Boring terminated at approximately 4.2 feet
below ground surface.

Refusal at 4.2 feet (1-1/4" to 1-1/2"
metal pipe)

LOG OF BORING NO. 134-S-01

PLATE

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

2

PROJECT NO. CTO 003

Date Started: 1/8/10 Date Completed: 1/7/10
 Logged By: W. Uchiyama
 Reviewed By: T. Sayre
 Total Depth: 4.5 ft
 Latitude: -122.36382
 Longitude: 37.72959

Location: Building 134
 Drilling method: Hand Auger
 Hammer Wt: None
 Surface Conditions: 6" Concrete
 Surface Elevation: Estimated 14

Depth (feet)	Sample Number Time	Sample Type	Blows/Foot	Recovery (%)	CVA (ppm) PID	USCS	Description	Remarks
1	1002W008 Time: 15:10	<input checked="" type="checkbox"/>			1.7		CLAYEY SAND (SC) - dark brown, some coarse gravel, cobbles	Depths measured from bottom of concrete slab.
2							SILTY SAND with GRAVEL (SM) - dark brown, coarse gravel	
3	1002W009 Time: 09:32	<input checked="" type="checkbox"/>					- wet	10 10
4	1/7/10							
5							Boring terminated at approximately 4.5 feet below ground surface.	Stopped boring at 4.5 feet due to side wall collapsing/sloughing
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

C:\NAPS\HUNTERS_POINT\CTO_003\DATA\CTO 003.DRI



PROJECT NO. CTO 003

LOG OF BORING NO. 134-S-02

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

PLATE

3

Date Started: 1/5/10 Date Completed: 1/8/10
 Logged By: N. Berner
 Reviewed By: T. Sayre
 Total Depth: 3.0 ft
 Latitude: -122.36287
 Longitude: 37.72695

Location: Building 203
 Drilling method: Hand Auger
 Hammer Wt: None
 Surface Conditions: 10" Concrete
 Surface Elevation: Estimated 12

Depth (feet)	Sample Number Time	Sample Type	Blows/Foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1002N002 Time:13:15	<input checked="" type="checkbox"/>			0.0		SAND (SP) - brown, dry, very loose, fine grained sand, trace fine gravel	Depth measured from bottom of concrete slab.
2								
3	1002N003 Time:14:00	<input checked="" type="checkbox"/>			0.0			
4								
5							Boring terminated at approximately 3 feet below ground surface.	
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								



LOG OF BORING NO. 203-S-01

PLATE

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

4

PROJECT NO. CTO 003

Date Started: 1/8/10 Date Completed: 1/8/10 Location: Building 203
 Logged By: N. Berner Drilling method: Hand Auger
 Reviewed By: T. Sayre Hammer Wt: None
 Total Depth: 1.6 ft Surface Conditions: 10" Concrete, Brick
 Latitude: -122.36285 Surface Elevation: Estimated 12
 Longitude: 37.72590

Depth (feet)	Sample Number Time	Sample Type	Blows/foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1002N004 Time: 14:47	<input checked="" type="checkbox"/>			0.0		FILL, SAND (SP) - brown, dry, dense, fine grained sand, some gravel, angular, brick fragments, cobbles	Depths measured from bottom of concrete slab.
2							SANDY GRAVEL (GP) - brown, coarse gravel, cobbles	Refusal at 1.5 feet - cobbles
3							Boring terminated at approximately 1.5 feet below ground surface.	
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

LOG OF BORING NO. 203-S-02

PLATE

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

5

PROJECT NO. CTO 003

Date Started: 1/8/10 Date Completed: 1/8/10
 Logged By: N. Berner
 Reviewed By: T. Sayre *Th. O. Sayre*
 Total Depth: 5.0 ft
 Latitude: -122.35282
 Longitude: 37.72581

Location: Building 203
 Drilling method: Hand Auger
 Hammer Wt: None
 Surface Conditions: 8" Concrete
 Surface Elevation: Estimated 12

Depth (feet)	Sample Number Time	Sample Type	Blows/foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1002N007 Time:10:04	<input checked="" type="checkbox"/>			0.0		FILL, SAND (SP) - brown, fine grained sand, some coarse gravel, concrete cobbles, metal fragments	Depth measured from bottom of concrete slab.
2								
3	1002N008 Time:10:48	<input checked="" type="checkbox"/>			0.0		FILL, SANDY GRAVEL (GP) - brown, coarse gravel, cobbles	
4							- brick fragments and cobbles	
5	1002N009 Time:14:13	<input checked="" type="checkbox"/>			0.0			
6							Boring terminated at approximately 5 feet below ground surface.	
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								



LOG OF BORING NO. 203-S-03

PLATE

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

6

PROJECT NO. CTO 003

Date Started: 1/8/10 Date Completed: 1/7/10 Location: Building 203
 Logged By: N. Berner Drilling method: Hand Auger
 Reviewed By: T. Seyre Hammer Wt: None
 Total Depth: 4.5 ft Surface Conditions: 8" Concrete
 Latitude: -122.38281 Surface Elevation: Estimated 12
 Longitude: 37.72871

Depth (feet)	Sample Number Time	Sample Type	Blows/foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1002N010 Time: 14:34	<input checked="" type="checkbox"/>			0.0		FILL, SAND (SP) - brown, fine grained sand, some coarse gravel, subangular	Depths measured from bottom of concrete slab.
2	1002N011 Time: 15:00	<input checked="" type="checkbox"/>			0.0			
3							- cobbles up to 12" diameter	
4	1002N014 Time: 10:15	<input checked="" type="checkbox"/>					SAND (SP) - brown, fine grained sand, some fine to coarse gravel, cobbles	Refusal at 4.5 feet - cobbles
5							Boring terminated at approximately 4.5 feet below ground surface.	
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

LOG OF BORING NO. 203-S-04

PLATE

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

7

PROJECT NO. CTO 003

Date Started: 1/8/10 Date Completed: 1/8/10
 Logged By: N. Berner
 Reviewed By: T. Seyre
 Total Depth: 3.0 ft
 Latitude: -122.36284
 Longitude: 37.72571

Location: Building 203
 Drilling method: Hand Auger
 Hammer Wt: None
 Surface Conditions: 8" Concrete
 Surface Elevation: Estimated 12

Depth (feet)	Sample Number Time	Sample Type	Blows/foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1002D002 Time:10:16	<input checked="" type="checkbox"/>					SAND (SP) - brown, moist, loose, fine to coarse grained sand, cobbles, some coarse gravel	Depth measured from bottom of concrete slab.
2								
3	1002D003 Time:10:40	<input checked="" type="checkbox"/>						Refusal at 3 feet - cobbles
4							Boring terminated at approximately 3 feet below ground surface.	
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								



LOG OF BORING NO. 203-S-05

PLATE

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

8

PROJECT NO. CTO 003

Date Started: 1/8/10 Date Completed: 1/8/10 Location: Building 203
 Logged By: N. Berner Drilling method: Hand Auger
 Reviewed By: T. Sayre Hammer Wt: None
 Total Depth: 3.0 ft Surface Conditions: 8" Concrete
 Latitude: -122.36288 Surface Elevation: Estimated 12
 Longitude: 37.72570

Depth (feet)	Sample Number Time	Sample Type	Blow/Feet	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1002N024 Time:10:30	<input checked="" type="checkbox"/>					SAND (SP) - brown, fine to coarse grained sand, some fine gravel, cobbles up to 6" diameter	Depths measured from bottom of concrete slab.
2							SAND (SP) - brown, moist, loose, fine to coarse grained sand, with fine gravel	
3	1002N025 Time:11:10	<input checked="" type="checkbox"/>						Refusal at 3 feet - cobbles
4							Boring terminated at approximately 3 feet below ground surface.	
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								



PROJECT NO. CTO 003

LOG OF BORING NO. 203-S-06

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

PLATE

9

Date Started: 1/8/10 Date Completed: 1/8/10 Location: Building 203
 Logged By: N. Berner Drilling method: Hand Auger
 Reviewed By: T. Seyre Hammer Wt: None
 Total Depth: 1.2 ft Surface Conditions: 8" Concrete
 Latitude: -122.38312 Surface Elevation: Estimated 12
 Longitude: 37.72588

Depth (feet)	Sample Number Time	Sample Type	Blows/Foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1002D004 Time: 15:19	<input checked="" type="checkbox"/>					FILL, SANDY GRAVEL (GP) - brown, asphalt fragments	Depth measured from bottom of concrete slab.
2							GRAVELLY SAND (SP) - brown, fine grained sand, fine gravel, subangular	Refusal at 1.2 feet - bedrock
3							Boring terminated at approximately 1.2 feet below ground surface.	
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								



LOG OF BORING NO. 203-S-07

PLATE

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

10

PROJECT NO. CTO 003

Date Started: 1/8/10 Date Completed: 1/8/10 Location: Building 203
 Logged By: N. Berner Drilling method: Hand Auger
 Reviewed By: T. Savre Hammer Wt: None
 Total Depth: 1.1 ft Surface Conditions: 6" Concrete
 Latitude: -122.36323 Surface Elevation: Estimated 12
 Longitude: 37.72556

Depth (feet)	Sample Number Time	Sample Type	Blows/foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1002D005 Time: 15:50	<input checked="" type="checkbox"/>					FILL, SANDY GRAVEL (GP) - brown, asphalt fragments	Depth measured from bottom of concrete slab.
2							GRAVELLY SAND (SP) - brown, fine grained sand, fine gravel, subangular	Refusal at 1.1 feet - bedrock
3							Boring terminated at approximately 1.1 feet below ground surface.	
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								



LOG OF BORING NO. 203-S-08

PLATE

PROJECT NO. CTO 003

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

11

Date Started: 1/7/10 Date Completed: 1/7/10 Location: Southeast edge of Building 214
 Logged By: N. Berner Drilling method: Macro Core
 Reviewed By: T. Seyre Hammer Wt: None
 Total Depth: 10.0 ft Surface Conditions: 2" Asphalt, 2" Aggregate Base
 Latitude: -122.36047 Surface Elevation: Estimated 13
 Longitude: 37.72739

Depth (feet)	Sample Number Time	Sample Type	Blows/foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1002N015 Time: 14:40			80			SANDY CLAY with GRAVEL (CL) - dark brown, moist, soft, medium plasticity, trace fine gravel subangular	Depths measured from bottom of aggregate base. Boring angled 30° NW. Depths on this log reflect boring length and are not vertically inferred.
2	0.4 ft bgs						CLAYEY SAND (SC) - gray, brown mottling, moist, medium dense, fine grained sand, trace fine gravel	
3	1002N016 Time: 14:43							
4	2.2 ft bgs							
5	1002N017 Time: 14:46			80			CLAYEY SAND (SC) - dark brown, moist, medium dense, fine to coarse grained sand, shell fragments	
6	3.9 ft bgs							
7	1002N018 Time: 15:00						SAND (SP) - dark brown, moist, medium dense, coarse grained sand, shell fragments	
8	5.6 ft bgs							
9	1002N019 Time: 15:02						SANDY CLAY (CL) - dark brown, moist, soft, coarse grained sand, medium plasticity	
10	7.4 ft bgs							
11	1002N020 Time: 15:04							
12	8.2 ft bgs							
13							Boring terminated at approximately 10 feet below ground surface.	
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								



LOG OF BORING NO. 214-S-01

PLATE

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

12

PROJECT NO. CTO 003

Date Started: 2/3/10 Date Completed: 2/3/10
 Logged By: N. Berner
 Reviewed By: T. Sayre
 Total Depth: 10.0 ft
 Latitude: -122.38054
 Longitude: 37.72734

Location: 5.5 ft. from Southeast edge of Building 214
 Drilling method: Hand Auger/ Hand Sampler/Macro Core
 Hammer Wt: None
 Surface Conditions: 2" Asphalt, 2" Aggregate Base
 Surface Elevation: Estimated 13

Depth (feet)	Sample Number Time	Sample Type	Blows/foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1006N027 Time: 13:32	<input checked="" type="checkbox"/>		100			FILL, CLAYEY SAND (SC) - dark brown, moist, trace fine gravel, cobbles, fine grained sand	Depths measured from bottom of aggregate base. Sampling Type: Hand Auger/Hand Sampler
2								
3	1006N028 Time: 14:08	<input checked="" type="checkbox"/>					FILL, CLAYEY SAND (SC) - dark brown, moist, fine grained sand, trace gravel, fine to coarse gravel, concrete fragments	
4							SANDY CLAY (CL) - brown, moist, fine grained sand, trace fine gravel	Sampling Type: Macro Core
5	1006N029 Time: 14:14	<input checked="" type="checkbox"/>					CLAYEY SAND (SC) - brown with orange-brown mottling, moist, fine grained sand, trace fine gravel	
6								
7	1006N030 Time: 14:37	<input checked="" type="checkbox"/>						
8								
9	1006N031 Time: 14:40	<input checked="" type="checkbox"/>					CLAYEY SAND (SC) - dark brown, moist, fine grained sand, trace fine gravel	
10	1006N032 Time: 14:42	<input checked="" type="checkbox"/>					- wood fragments	
11							Boring terminated at approximately 10 feet below ground surface. Groundwater not encountered. Borehole grouted to grade with neat cement upon completion. Sampling and logging of soil conducted from composite of two advancement attempts at borehole location. See field notes for more details.	
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA



PROJECT NO.

CTO 003

LOG OF BORING NO. 214-STEP-01

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

PLATE

13

Date Started: 2/3/10 Date Completed: 2/3/10
 Logged By: N. Berner
 Reviewed By: T. Seyre
 Total Depth: 10.0 ft
 Latitude: -122.36084
 Longitude: 37.72733

Location: 5.5 ft. from Southwest edge of Building 214
 Drilling method: Hand Auger/ Hand Sampler/Macro Core
 Hammer Wt: None
 Surface Conditions: 2" Asphalt, 2" Aggregate Base
 Surface Elevation: Estimated 13

Depth (feet)	Sample Number Time	Sample Type	Blows/Feet	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1008N033 Time: 15:07	X		100			CLAYEY SAND (SC) - brown, moist, fine grained sand, trace gravel	Depths measured from bottom of aggregate base. Sampling Type: Hand Auger/Hand Sampler
2								
3	1008N034 Time: 15:18	X					CLAYEY SAND (SC) - dark brown, moist, fine grained sand, trace fine gravel	
4								
5	1008N035 Time: 15:28	X						Sampling Type: Macro Core
6								
7	1008N038 Time: 16:02	X					CLAYEY SAND (SC) - brown with tan mottling, moist, fine grained sand, trace fine gravel	
8								
9	1008N037 Time: 16:05						- wet	
10	1008N038 Time: 16:09						- wood fragments	
11								
12							Boring terminated at approximately 10 feet below ground surface.	
13							Borehole grouted to grade with neat cement upon completion.	
14							Sampling and logging of soil conducted from composite of two advancement attempts at borehole location. See field notes for more details.	
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

LOG OF BORING NO. 214-STEP-02

PLATE

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

14

PROJECT NO. CTO 003

Date Started: 2/4/10 Date Completed: 2/4/10 Location: 8.5 ft. from Southwest edge of Building 214
 Logged By: N. Berner Drilling method: Hand Auger/ Hand Sampler/Macro Core
 Reviewed By: T. Sayre Hammer Wt: None
 Total Depth: 10.0 ft Surface Conditions: 2" Asphalt, 4" Aggregate Base
 Latitude: -122.38074 Surface Elevation: Estimated 13
 Longitude: 37.72740

Depth (feet)	Sample Number Time	Sample Type	Blows/foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1006N041 Time: 10:38	<input checked="" type="checkbox"/>		100			CLAYEY SAND (SC) - dark brown, moist, fine grained sand, trace fine to coarse gravel	Depths measured from bottom of aggregate base. Sampling Type: Hand Auger/Hand Sampler
2								
3	1006N042 Time: 10:47	<input checked="" type="checkbox"/>					SANDY CLAY (CL) - dark brown, moist, fine grained sand, trace fine gravel, cobbles	
4								Sampling Type: Macro Core
5	1006N043 Time: 10:58	<input checked="" type="checkbox"/>					SANDY CLAY (CL) - dark brown, moist, fine grained sand, trace coarse gravel	
6							CLAYEY SAND (SC) - light brown, moist, fine to coarse grained sand, trace fine to coarse gravel	
7	1006N046 Time: 12:16	<input checked="" type="checkbox"/>					GRAVELLY SAND (SP) - tan, moist, fine grained sand, some fine to coarse gravel	
8							SANDY CLAY (CL) - light brown to brown, moist, coarse grained sand, trace fine gravel	
9	1006N044 Time: 11:28	<input checked="" type="checkbox"/>					CLAYEY SAND (SC) - dark brown, moist, fine to coarse grained sand, some coarse gravel	Boring terminated at approximately 10 feet below ground surface. Groundwater not encountered. Borehole grouted to grade with neat cement upon completion. Sampling and logging of soil conducted from composite of three advancement attempts at borehole location. See field notes for more details.
10	1006N045 Time: 11:30	<input checked="" type="checkbox"/>						
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								



LOG OF BORING NO. 214-STEP-03

PLATE

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

15

PROJECT NO. CTO 003

Date Started: 1/7/10 Date Completed: 1/12/10 Location: Building 231
 Logged By: J. Gaines Drilling method: Hand Auger
 Reviewed By: T. Sayre Hammer Wt: None
 Total Depth: 3.9 ft Surface Conditions: 10" Concrete
 Latitude: -122.38806 Surface Elevation: Estimated 12
 Longitude: 37.72803

Depth (feet)	Sample Number Time	Sample Type	Blows/foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1002W010 Time: 15:00 1/7/10	<input checked="" type="checkbox"/>					SAND with GRAVEL (SP) - grayish green, moist, poorly graded fine gravel	Depth measured from bottom of concrete slab.
2							SAND with CLAY & GRAVEL (SP) - brown, poorly graded fine gravel	
3	1003G001 Time: 11:41 1/11/10	<input checked="" type="checkbox"/>					COBBLES with SAND & GRAVEL	
4								Refusal at 3.9 feet - cobbles
5							Boring terminated at approximately 3.9 feet below ground surface.	
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								



LOG OF BORING NO. 231E-S-01

PLATE

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

16

PROJECT NO. CTO 003

Date Started: 1/12/10 Date Completed: 1/12/10
 Logged By: J. Gaines
 Reviewed By: T. Bayre *Thomas Bayre*
 Total Depth: 1.3 ft
 Latitude: -122.35802
 Longitude: 37.72828

Location: Building 231
 Drilling method: Hand Auger
 Hammer Wt: None
 Surface Conditions: 11.5" Concrete
 Surface Elevation: Estimated 12

Depth (feet)	Sample Number Time	Sample Type	Blows/foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1	1003G004 Time: 11:55	<input checked="" type="checkbox"/>					FILL, SAND (SP) - brown, moist, loose to medium dense, fine grained sand, well sorted, fragments of brick and concrete (FILL)	Depth measured from bottom of concrete slab.
2								Refusal at 1.3 feet - concrete slab
3							Boring terminated at approximately 1.3 feet below ground surface.	
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

C:\000\HPC\HUNTERS_POINT\CTO_003\DATA\CTO 003.gpr



PROJECT NO. CTO 003

LOG OF BORING NO. 231E-S-02

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

PLATE

17

Date Started: 1/12/10 Date Completed: 1/12/10
 Logged By: J. Gaines
 Reviewed By: T. Sayre
 Total Depth: 0.5 ft
 Latitude: -122.35787
 Longitude: 37.72810

Location: Building 231
 Drilling method: Hand Auger
 Hammer Wt: None
 Surface Conditions: 11.5" Concrete
 Surface Elevation: Estimated 12

Depth (feet)	Sample Number Time	Sample Type	Blows/foot	Recovery (%)	OVA (ppm) PID	USCS	Description	Remarks
1							FILL, SAND with CLAY (SC) - brown, moist, fine grained sand, some coarse gravel	Depths measured from bottom of concrete slab.
2							Boring terminated at approximately 0.5 feet below ground surface.	Refusal at 0.5 feet - concrete slab
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

LOG OF BORING NO. 231E-S-03

PLATE



PROJECT NO. CTO 003

CTO-003 - PARCEL C DATA GAP INVESTIGATION
 HUNTERS POINT NAVAL SHIPYARD
 SAN FRANCISCO, CALIFORNIA

18

Appendix D

Chain-of-custody Forms

This page intentionally left blank.

C.O.C. № 30755

[illegible]

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler

1/5/10

C.O.C. № 30756

Report to: PLEASE PRINT Company Name: <u>KCH</u> Address: <u>1970 Broadway Suite 710</u> <u>Oakland, CA 94612</u> Attn: <u>Patricia Walters</u>		Invoice to: PLEASE PRINT Company Name: <u>KCH</u> Address: _____ Attn: _____	
Project Name/Number <u>CT0003/10588</u>		Sampler (Print) <u>Patricia Walters</u>	
Purchase Order Number <u>105688</u>		Sampler (Signature) <u>Patricia Walters</u>	
Sample Identification <u>1002X001</u>		Location <u>Trip Blank</u>	
Date Collected <u>1/5/10</u>		Time Collected <u>1521</u>	
Matrix <u>L</u>		Number of Containers <u>6</u>	
Analysis Requested/Method Number <u>BTEx, MTBE, Naphthalene - 5030C/18250B</u> <u>TPH-P - 5030C/18015C</u>		Date Shipped: <u>Tu 1/5/10</u>	
Carrier:		Waybill No.:	
Comments:			
Shuttle Temperature: <u>3.0°</u>		Turnaround Requested: MUST CHECK ONE <input type="checkbox"/> Standard (2-3 week) <input checked="" type="checkbox"/> 48hr prelim <input type="checkbox"/> One week final <input type="checkbox"/> 24-48 hour	
Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (30-day retention)			
Relinquished by sampler: <u>Patricia Walters</u>		Date <u>1/5/10</u>	
Time <u>1620</u>		Received by:	
Relinquished by:		Date <u>1/10/10</u>	
Time <u>2100</u>		Received at lab by:	

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler

175/10

C.O.C. № 31957

Report to: Company Name: <u>KCH</u> Address: _____ Attn: _____						PLEASE PRINT Invoice to: Company Name: <u>KCH</u> Address: _____ Attn: _____						Phone: <u>415-822-2253</u> Fax: <u>415-822-1329</u>						Phone: _____ Fax: _____																													
Project Name/Number <u>CT0003/105688</u>						Sampler (Print) <u>Patricia Walters</u>						Analysis Requested/Method Number Percent Moisture - <u>CUP</u> Aroclor 1260 - <u>X</u> 3550B/12082A - <u>X</u> CW-2050B - <u>X</u> G010C - <u>X</u> Organic Lead - <u>X</u> DITS LUFT - <u>X</u> PHTS - 3550B - <u>X</u> 8270BSIM - <u>X</u> SYOCS # - 3550B - <u>X</u> 8270D - <u>X</u> BTEX MTBE - <u>X</u> Volatiles - <u>X</u> EPA 821 - <u>X</u> TPH-P - 5035 - <u>X</u> 8015C - <u>X</u> TPH-e.w/SGC - <u>X</u> 3550B/12630C/8015C - <u>X</u>						Date Shipped:																													
Purchase Order Number <u>105688</u>						Sampler (Signature) <u>[Signature]</u>												Carrier:																													
Sample Identification						Location						Date Collected						Time Collected						Matrix						Number of Containers						Comments: <u>Report soil results as dry weight</u>											
<u>1002N007</u>						<u>203-S-03-0.5</u>						<u>1/6/10</u>						<u>1004</u>						<u>S</u>						<u>3</u>						<u>ms/msd</u>											
<u>1002N008</u>						<u>203-S-03-2.5</u>						<u>↓</u>						<u>1048</u>						<u>↓</u>						<u>2</u>																	
<u>1002W005</u>						<u>134-S-01-2.5</u>						<u>↓</u>						<u>1023</u>						<u>↓</u>						<u>4</u>						* Report only the following compounds as SVOCs: Bis(2-ethylhexyl)phthalate 1,4-Dichlorobenzene 2,3-Dichlorobenzidine N-nitrosodi-n-propylamine											
<u>rw 11610</u>																														Please quantify: gas as C6-C12 liquid as C12-C24 motor oil as C24-36																	
Shuttle Temperature:						Turnaround Requested: MUST CHECK ONE <input checked="" type="checkbox"/> 48 hr prelim <input type="checkbox"/> Standard (2-3 week) <input checked="" type="checkbox"/> One week <input type="checkbox"/> 24-48 hour						Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (90-day retention)																																			
Relinquished by sampler: <u>[Signature]</u>						Date <u>1/6/10</u>						Time <u>1559</u>						Received by:						Relinquished by:						Date <u>1/6/10</u>						Time <u>2025</u>						Received by: <u>[Signature]</u>					
Relinquished by:						Date						Time						Received by:						Relinquished by:						Date						Time						Received at lab by:					

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler

1/7/10 800

C.O.C. № 31956

[illegible]

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler



APPL Labs
908 North Temperance Ave.
Clovis, CA 93611

Phone: (559) 275-2175

Fax: (559) 275-4422

CHAIN OF CUSTODY RECORD

pg 1 of 2

C.O.C. N^o 31960

Report to: PLEASE PRINT Company Name: <u>KCH</u> Address: <u>1970 Broadway Ste. #710</u> <u>Oakland, CA 94612</u> Attn: <u>Patricia Walters</u>	Invoice to: PLEASE PRINT Company Name: <u>KCH</u> Address: _____ Attn: _____
Phone: <u>415.822.2253</u> Fax: <u>415.822.1329</u>	Phone: _____ Fax: _____

Project Name/Number		Sampler (Print)		Analysis Requested/Method Number		Date Shipped:	
CTD 003/105688		Patricia Walters				Carrier:	
Purchase Order Number		Sampler (Signature)				Waybill No.:	
105688		Patricia Walters				Comments:	
Sample Identification		Location		Date Collected	Time Collected	Matrix	Number of Containers
1002N012		203-S-04-2.5		1/6/10	1615	L	3
1002W007		134-S-02-0.5			1540		6
1002W004		Trip Blank			0800		6
1002N006		Trip Blank			0800		3
1002X003		Trip Blank		1/7/10	1552		6
		288 PM Fax 1-8-10 PM					

Shuttle Temperature: <u>2.5°C</u>	Turnaround Requested: MUST CHECK ONE <input type="checkbox"/> Standard (2-3 week) <input checked="" type="checkbox"/> <u>1/2 hr prelim</u> One week <input type="checkbox"/> 24-48 hour	Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (30-day retention)
Relinquished by sampler: <u>Patricia Walters</u>	Date: <u>1/7/10</u> Time: <u>1559</u> Received by: <u>[Signature]</u>	Date: <u>1/7/10</u> Time: <u>2150</u> Received by: _____
Relinquished by:	Date: _____ Time: _____ Received by: _____	Date: <u>1/8/10</u> Time: <u>800</u> Received at lab by: <u>[Signature]</u>

White: Return to client with report Yellow: Laboratory Copy Pink: Sampler



APPL Labs
908 North Temperance Ave.
Clovis, CA 93611

Phone: (559) 275-2175

Fax: (559) 275-4422

CHAIN OF CUSTODY RECORD

pg 2 of 2

C.O.C. N° 30757

Report to: PLEASE PRINT						Invoice to: PLEASE PRINT																					
Company Name: <u>KCH</u>						Company Name: <u>KCH</u>						Phone: _____															
Address: <u>1970 Broadway Ste # 710</u>						Address: _____						Fax: _____															
Attn: <u>Patricia Walters</u>						Attn: _____						Fax: _____															
Project Name/Number <u>CT0003 / 105688</u>		Sampler (Print) <u>Patricia Walters</u>				Analysis Requested/Method Number												Date Shipped:									
Purchase Order Number <u>105688</u>		Sampler (Signature) <u>Patricia Walters</u>																Carrier:									
																		Waybill No.:									
																		Comments: <u>Report Soil Results</u>									
Sample Identification		Location	Date Collected	Time Collected	Matrix	Number of Containers	Percent Moisture	Avacolor 1260	3550B 180824	Organic Lead	DTG LuFT	Copper	3050B 160100	Naphthalene	5035A 182608	SVOCs * - 3550B	8270D	PATTS - 3550B	8270D SIM	BTEX, MTBE, Naphthalene	5035A 182608	TPH-P - 5035A	8015C	TPH-e w/ silicate clamp	3550B 136300/18015C	20/12/10	
1002N009	203-S-03-4.5	116110	1413	S	2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	as dry weight
1002N010	203-S-04-0.5	↓	1434	↓	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	please clarify:
1002W006	134-S-02-0.5	↓	1510	↓	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	gas as C6-C12
1002N011	203-S-04-2.5	116110	1500	S	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	diesel as C12-C24
<p>SVOCs consist of:</p> <p>Bis(2-ethylhexyl)phthalate</p> <p>1,4-Dichlorobenzene</p> <p>3,3'-Dichlorobenzidine</p> <p>N-nitrosodimethylamine</p>																											
<p>Shuttle Temperature: _____</p> <p>Turnaround Requested: MUST CHECK ONE</p> <p><input checked="" type="checkbox"/> 48hr. prelim.</p> <p><input type="checkbox"/> Standard (2-3 week) <input checked="" type="checkbox"/> One week final <input type="checkbox"/> 24-48 hour</p> <p>Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (30-day retention)</p>																											
Relinquished by sampler:		Date	Time	Received by:		Relinquished by:		Date	Time	Received by:																	
<u>Patricia Walters</u>		1/7/10	1559	<u>[Signature]</u>		<u>[Signature]</u>		1/7/10	2150	<u>[Signature]</u>																	
Relinquished by:		Date	Time	Received by:		Relinquished by:		Date	Time	Received at lab by:																	
						<u>[Signature]</u>		1/8/10	800	<u>[Signature]</u>																	

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler



APPL Labs
908 North Temperance Ave.
Clovis, CA 93611

Phone: (559) 275-2175

Fax: (559) 275-4422

CHAIN OF CUSTODY RECORD

C.O.C. N^o 31961

Report to: PLEASE PRINT		Invoice to: PLEASE PRINT	
Company Name: <u>KCH</u>	Phone: <u>415-822-2253</u>	Company Name: <u>KCH</u>	Phone: _____
Address: <u>1970 Broadway Ste 710</u>		Address: _____	
<u>Oakland, CA 94612</u>	Fax: <u>415-822-1329</u>		Fax: _____
Attn: <u>Patricia Walters</u>		Attn: _____	

Project Name/Number <u>170003/105688</u>		Sampler (Print) <u>Patricia Walters</u>		Analysis Requested/Method Number												Date Shipped:			
Purchase Order Number <u>105688</u>		Sampler (Signature) <u>Patricia Walters</u>														Carrier:			
																Waybill No.:			
																Comments: <u>Report soil results as dry weight</u>			
Sample Identification	Location	Date Collected	Time Collected	Matrix	Number of Containers	Naphthalene - 5030C/8260B	Naphthalene - 5030A/8260B	Copper - 3050B/6100C	Organic - Lead - DIFS LUFT	SVOCs - 3550B/8230D	PAHs - 3550B/8230D	Percent Moisture - CLP	Lead (total) - 3050B/6100C	<u>SLCs consist of:</u> <u>Bis(2-ethylhexyl) phthalate</u> <u>1,4-Dichlorobenzene</u> <u>3,3'-Dichlorobenzidine</u> <u>N-nitrosodipropylamine</u> <u>MS/MSD</u>					
1002N013	Trip Blank	1-7-10	0800	L	3	X													
1002N014	203-S-04-4.5		1015	S	5		X	X	X	X	X	X							
1002N015	214-S-01-0.5		1440		2				X	X	X	X							
1002N016	214-S-01-2.5		1443		1				X	X	X	X							
1002N017	214-S-01-4.5		1445		1				X	X	X	X							
1002N018	214-S-01-9.5		1500		1				X	X	X	X							
1002N019	214-S-01-8.5		1502		1				X	X	X	X							
1002N020	214-S-01-6.5		1504		1				X	X	X	X							
1002N022	Fr 203-S-04-4.5	1-7-10	1612	L	3	X													
Shuttle Temperature: <u>2.5°C</u>		Turnaround Requested: MUST CHECK ONE <input type="checkbox"/> Standard (2-3 week) <input checked="" type="checkbox"/> 48 hr. prelim <input checked="" type="checkbox"/> One week <input type="checkbox"/> 24-48 hour								Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (30-day retention)									
Relinquished by sampler: <u>Patricia Walters</u>		Date	Time	Received by:		Relinquished by:		Date	Time	Received by:									
		1-7-10	1630	<u>[Signature]</u>		<u>[Signature]</u>		1/7/10	2150	<u>[Signature]</u>									
Relinquished by:		Date	Time	Received by:		Relinquished by:		Date	Time	Received at lab by:									
						<u>[Signature]</u>		1/8/10	800	<u>[Signature]</u>									

White: Return to client with report Yellow: Laboratory Copy Pink: Sampler



APPL Labs
908 North Temperance Ave.
Clovis, CA 93611

Phone: (559) 275-2175

Fax: (559) 275-4422

CHAIN OF CUSTODY RECORD

C.O.C. N° 31962

Report to: PLEASE PRINT Company Name: <u>Kelt</u> Phone: <u>415 822 2153</u> Address: <u>1970 Broadway Ste 710</u> <u>Oakland, CA 94612</u> Fax: <u>415 822 1329</u> Attn: <u>Patricia Walters</u>						Invoice to: PLEASE PRINT Company Name: <u>Kelt</u> Phone: _____ Address: _____ Fax: _____ Attn: _____									
Project Name/Number <u>CTO 003 / 105688</u>		Sampler (Print) <u>Patricia Walters</u>				Analysis Requested/Method Number						Date Shipped:			
Purchase Order Number <u>105688</u>		Sampler (Signature) <u>Patricia Walters</u>				<div>Lead total - 3010A/16010C SVCS* - 3510C/1870D PMS - 3510C 8270D SIM Copper - 200A/16010C Organic lead - DESS LUPT</div> <div>SWCS consist of: 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine N-nitrosodi-n-propylamine Bis(2-ethylhexylphthalate)</div>						Carrier:			
Sample Identification		Location		Date Collected	Time Collected							Matrix	Number of Containers	Waybill No.:	
<u>1002N021</u>		<u>214-S-01-6.5</u>		<u>1-7-10</u>	<u>1548</u>	<u>L</u>	<u>4</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<div>PU 1/7/10</div> <div>PU 1/7/10</div> <div>PU 1/7/10</div>
<u>1002N022</u>		<u>203-S-04-4.5</u>		<u>↓</u>	<u>1612</u>	<u>↓</u>	<u>5</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>		
Shuttle Temperature: <u>2.5°</u>		Turnaround Requested: MUST CHECK ONE <input type="checkbox"/> Standard (2-3 week) <input checked="" type="checkbox"/> One week <u>48hr prelim</u> <input type="checkbox"/> 24-48 hour						Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (30-day retention)							
Relinquished by sampler: <u>Patricia Walters</u>		Date <u>1-7-10</u>	Time <u>1642</u>	Received by: <u>[Signature]</u>		Relinquished by:		Date <u>1/7/10</u>	Time <u>12 50</u>	Received by:					
Relinquished by:		Date	Time	Received by:		Relinquished by:		Date <u>1/8/10</u>	Time <u>800</u>	Received at lab by: <u>[Signature]</u>					

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler



APPL Labs
908 North Temperance Ave.
Clovis, CA 93611

Phone: (559) 275-2175

Fax: (559) 275-4422

CHAIN OF CUSTODY RECORD

C.O.C. No. 31959

Report to: PLEASE PRINT Company Name: <u>KCH</u> Phone: <u>415.822.2253</u> Address: <u>1970 Broadway Ste #710</u> <u>Oakland, CA 94612</u> Fax: <u>415.822.1329</u> Attn: <u>Patricia Walters</u>						Invoice to: PLEASE PRINT Company Name: <u>KCH</u> Phone: _____ Address: _____ Fax: _____ Attn: _____							
Project Name/Number <u>CTD 003 / 105688</u>		Sampler (Print) <u>Patricia Walters</u>				Analysis Requested Method Number						Date Shipped:	
Purchase Order Number <u>105688</u>		Sampler (Signature) <u>Patricia Walters</u>				Copper - 300A1 6016C Organic lead DHS LUT ANALYST 1260 3510C 18088A SVOCs - 3510C 18270D PAHs - 3510C 18270D TPH & silica 3510C 18270D 3510C 18270D						Carrier:	
Sample Identification		Location		Date Collected	Time Collected	Matrix	Number of Containers	Waybill No.:					
<u>1002N012</u>		<u>203-S-04-25</u>		<u>1/6/10</u>	<u>1615</u>	<u>L</u>	<u>5</u>	Comments:					
<u>1002W007</u>		<u>134-S-02-05</u>		<u>↓</u>	<u>1540</u>	<u>↓</u>	<u>6</u>	<u>please quantify:</u> <u>diesel as C12-C24</u> <u>motor oils as C24-C36</u> <u>*SVOCs consist of:</u> <u>Bis(2-ethylhexyl)phthalate</u> <u>1,4-Dichlorobenzene</u> <u>3,3'-Dichlorobenzidine</u> <u>N-nitrosodi-n-propylamine</u>					
Shuttle Temperature: <u>2.0 C</u>		Turnaround Requested: MUST CHECK ONE <input checked="" type="checkbox"/> 48 hr prelim <input type="checkbox"/> Standard (2-3 week) <input checked="" type="checkbox"/> One week final <input type="checkbox"/> 24-48 hour						Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (30-day retention)					
Relinquished by sampler: <u>Patricia Walters</u>		Date <u>1/7/10</u>	Time <u>1505</u>	Received by: <u>[Signature]</u>		Relinquished by:		Date <u>1/7/10</u>	Time <u>2150</u>	Received by:			
Relinquished by:		Date	Time	Received by:		Relinquished by:		Date	Time	Received at lab by:			

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler

Report to: PLEASE PRINT Company Name: <u>KCH</u> Address: <u>1970 Broadway St 710</u> <u>Oakland, CA 94612</u> Attn: <u>Patricia Walters</u>				Invoice to: PLEASE PRINT Company Name: <u>KCH</u> Address: _____ Attn: _____			
Phone: <u>415.822.2253</u> Fax: <u>415.822.1329</u>				Phone: _____ Fax: _____			

Project Name/Number <u>CT0003105688</u>		Sampler (Print) <u>Patricia Walters</u>		Analysis Requested/Method Number		Date Shipped:	
Purchase Order Number <u>105688</u>		Sampler (Signature) <u>Patricia Walters</u>				Carrier:	
Sample Identification		Location		Date Collected		Waybill No.:	
				Time Collected		Comments: <u>report soil results as dry weight</u>	
				Matrix		*SVOCs consist of: Bis(2-ethylhexyl) phthalate 1,4-Dichlorobenzene 3,3'-Dichlorobenzidine N-Nitrosodipropylamine	
				Number of Containers		**Please Quantify: diesel as C10-C26 motor oil as C18-C30 Silica gel cleanup not required for 1002N024 and 1002N025	

Sample Identification	Location	Date Collected	Time Collected	Matrix	Number of Containers	BTEX, Naphthalene	5035A/182008	Organic Lead	DHS LIFT	SVOCs *	3550B/182008	PATHS - 3550B/182008	8170D SIM	TPH *	3550B/18015	Percent material	Aroclor 1260	3550B/18015	Cu + Mn + Lead (total)	3550B/1601C	Mn -	3550B/1601C
1002N024	203-S-06-0.5	11/8/10	1030	S	5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1002N025	203-S-06-2.5		1110		5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
1002D002	203-S-05-0.5		1015		1												X	X	X			
1002D003	203-S-05-2.5		1040		1												X	X	X			
1002D004	203-S-07-0.5		1519		1												X	X				
1002D005	203-S-08-0.5		1550		1												X			X		

Shuttle Temperature: <u>1c</u>		Turnaround Requested: MUST CHECK ONE <input type="checkbox"/> Standard (2-3 week) <input checked="" type="checkbox"/> One week <input type="checkbox"/> 24-48 hour				Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (90-day retention)	
Relinquished by sampler: <u>Patricia Walters</u>		Date <u>11/8/10</u>	Time <u>1640</u>	Received by:		Relinquished by:	
Relinquished by:		Date	Time	Received by:		Relinquished by:	

Date <u>11/8/10</u>		Time <u>21:10</u>		Received at lab by: <u>Yang</u>	
------------------------	--	----------------------	--	------------------------------------	--

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler

C.O.C. № 30758

[illegible]

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler

C.O.C. No 30759

Report to: PLEASE PRINT Company Name: <u>KCH</u> Address: <u>1970 Broadway Ste 710</u> <u>Oakland, CA 94612</u> Attn: <u>Patricia Walters</u>						Invoice to: PLEASE PRINT Company Name: <u>KCH</u> Address: _____ Attn: _____ Phone: <u>415-822-2253</u> Fax: <u>415-822-1329</u>							
Project Name/Number <u>CT0003/105688</u>		Sampler (Print) <u>Patricia Walters</u>				Analysis Requested/Method Number						Date Shipped:	
Purchase Order Number <u>105688</u>		Sampler (Signature) <u>Patricia Walters</u>										Carrier:	
Sample Identification		Location		Date Collected	Time Collected	Matrix	Number of Containers	Lead (Total) 30.50g/60.00g	Percent Moisture P.L.P.	Lead (Total) 30.10g/60.00g	Waybill No.:		
<u>1003G001</u>		<u>231E-S-01-2.5</u>		<u>11/11/10</u>	<u>1141</u>	<u>S</u>	<u>1</u>	<u>X</u>	<u>X</u>		Comments: <u>Report soil results as dry weight</u>		
<u>1003G002</u>		<u>231E-S-01-2.5</u>		<u>↓</u>	<u>1530</u>	<u>L</u>	<u>1</u>	<u>X</u>	<u>X</u>				
<div>Diagonal line across the table with handwritten notes: "No 11/10" and "No 11/10"</div>													
Shuttle Temperature: <u>1°C</u>		Turnaround Requested: MUST CHECK ONE <input type="checkbox"/> Standard (2-3 week) <input checked="" type="checkbox"/> <u>48 hr</u> One week <input type="checkbox"/> 24-48 hour						Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (30-day retention)					
Relinquished by sampler: <u>Patricia Walters</u>		Date <u>11/11/10</u>	Time <u>1614</u>	Received by:			Relinquished by:			Date <u>11/11/10</u>	Time <u>20:25</u>	Received at lab by: <u>Yang</u>	
Relinquished by:		Date	Time	Received by:			Relinquished by:			Date	Time	Received at lab by:	

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler

C.O.C. № 31976

Report to: PLEASE PRINT Company Name: KCH Address: 1970 BROADWAY, Suite 710 OAKLAND, CA 94612 Attn: PATRICIA WALTERS				Invoice to: PLEASE PRINT Company Name: KCH Address: _____ Attn: _____ Phone: 415-822-2253 Fax: 415-822-1329			
Project Name/Number CTD-003/105688		Sampler (Print) Patrick Walters		Analysis Requested/Method Number 15035A 15035B 15035C 15035D 15035E 15035F 15035G 15035H 15035I 15035J 15035K 15035L 15035M 15035N 15035O 15035P 15035Q 15035R 15035S 15035T 15035U 15035V 15035W 15035X 15035Y 15035Z 15036A 15036B 15036C 15036D 15036E 15036F 15036G 15036H 15036I 15036J 15036K 15036L 15036M 15036N 15036O 15036P 15036Q 15036R 15036S 15036T 15036U 15036V 15036W 15036X 15036Y 15036Z 15037A 15037B 15037C 15037D 15037E 15037F 15037G 15037H 15037I 15037J 15037K 15037L 15037M 15037N 15037O 15037P 15037Q 15037R 15037S 15037T 15037U 15037V 15037W 15037X 15037Y 15037Z 15038A 15038B 15038C 15038D 15038E 15038F 15038G 15038H 15038I 15038J 15038K 15038L 15038M 15038N 15038O 15038P 15038Q 15038R 15038S 15038T 15038U 15038V 15038W 15038X 15038Y 15038Z 15039A 15039B 15039C 15039D 15039E 15039F 15039G 15039H 15039I 15039J 15039K 15039L 15039M 15039N 15039O 15039P 15039Q 15039R 15039S 15039T 15039U 15039V 15039W 15039X 15039Y 15039Z 15040A 15040B 15040C 15040D 15040E 15040F 15040G 15040H 15040I 15040J 15040K 15040L 15040M 15040N 15040O 15040P 15040Q 15040R 15040S 15040T 15040U 15040V 15040W 15040X 15040Y 15040Z 15041A 15041B 15041C 15041D 15041E 15041F 15041G 15041H 15041I 15041J 15041K 15041L 15041M 15041N 15041O 15041P 15041Q 15041R 15041S 15041T 15041U 15041V 15041W 15041X 15041Y 15041Z 15042A 15042B 15042C 15042D 15042E 15042F 15042G 15042H 15042I 15042J 15042K 15042L 15042M 15042N 15042O 15042P 15042Q 15042R 15042S 15042T 15042U 15042V 15042W 15042X 15042Y 15042Z 15043A 15043B 15043C 15043D 15043E 15043F 15043G 15043H 15043I 15043J 15043K 15043L 15043M 15043N 15043O 15043P 15043Q 15043R 15043S 15043T 15043U 15043V 15043W 15043X 15043Y 15043Z 15044A 15044B 15044C 15044D 15044E 15044F 15044G 15044H 15044I 15044J 15044K 15044L 15044M 15044N 15044O 15044P 15044Q 15044R 15044S 15044T 15044U 15044V 15044W 15044X 15044Y 15044Z 15045A 15045B 15045C 15045D 15045E 15045F 15045G 15045H 15045I 15045J 15045K 15045L 15045M 15045N 15045O 15045P 15045Q 15045R 15045S 15045T 15045U 15045V 15045W 15045X 15045Y 15045Z 15046A 15046B 15046C 15046D 15046E 15046F 15046G 15046H 15046I 15046J 15046K 15046L 15046M 15046N 15046O 15046P 15046Q 15046R 15046S 15046T 15046U 15046V 15046W 15046X 15046Y 15046Z 15047A 15047B 15047C 15047D 15047E 15047F 15047G 15047H 15047I 15047J 15047K 15047L 15047M 15047N 15047O 15047P 15047Q 15047R 15047S 15047T 15047U 15047V 15047W 15047X 15047Y 15047Z 15048A 15048B 15048C 15048D 15048E 15048F 15048G 15048H 15048I 15048J 15048K 15048L 15048M 15048N 15048O 15048P 15048Q 15048R 15048S 15048T 15048U 15048V 15048W 15048X 15048Y 15048Z 15049A 15049B 15049C 15049D 15049E 15049F 15049G 15049H 15049I 15049J 15049K 15049L 15049M 15049N 15049O 15049P 15049Q 15049R 15049S 15049T 15049U 15049V 15049W 15049X 15049Y 15049Z 15050A 15050B 15050C 15050D 15050E 15050F 15050G 15050H 15050I 15050J 15050K 15050L 15050M 15050N 15050O 15050P 15050Q 15050R 15050S 15050T 15050U 15050V 15050W 15050X 15050Y 15050Z 15051A 15051B 15051C 15051D 15051E 15051F 15051G 15051H 15051I 15051J 15051K 15051L 15051M 15051N 15051O 15051P 15051Q 15051R 15051S 15051T 15051U 15051V 15051W 15051X 15051Y 15051Z 15052A 15052B 15052C 15052D 15052E 15052F 15052G 15052H 15052I 15052J 15052K 15052L 15052M 15052N 15052O 15052P 15052Q 15052R 15052S 15052T 15052U 15052V 15052W 15052X 15052Y 15052Z 15053A 15053B 15053C 15053D 15053E 15053F 15053G 15053H 15053I 15053J 			

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler



APPL Labs
908 North Temperance Ave.
Clovis, CA 93611

Phone: (559) 275-2175

Fax: (559) 275-4422

CHAIN OF CUSTODY RECORD

C.O.C. No. 31977

Report to: PLEASE PRINT Company Name: <u>KCH</u> Phone: <u>415-822-2253</u> Address: <u>1970 BROADWAY, SUITE 710</u> <u>OAKLAND, CA 94612</u> Fax: <u>415-822-1329</u> Attn: <u>PATRICIA WALTERS</u>						Invoice to: PLEASE PRINT Company Name: <u>KCH</u> Phone: _____ Address: _____ Fax: _____ Attn: _____									
Project Name/Number <u>OTO-003/105688</u>		Sampler (Print) _____		Analysis Requested/Method Number <u>BOEM, MCOE, NARITHACON</u> <u>82606/5030C</u> <u>TPH-P</u> <u>8015C/5030C</u> <u>SVOCs*</u> <u>82700/5510C</u> <u>PAHS</u> <u>82705/5510C</u> <u>TPH-e**</u> <u>8015C/5510C/560C</u> <u>Lead, Total</u> <u>600C/13010A</u>				Date Shipped: _____							
Purchase Order Number <u>105688</u>		Sampler (Signature) _____		Carrier: _____				Waybill No.: _____							
Sample Identification		Location		Date Collected		Time Collected		Matrix		Number of Containers		Comments: <u>* SVOCs</u> <u>CONSIST OF</u> <u>Bis(2-ethylhexyl)phthalate</u> <u>1,4-dichlorobenzene</u> <u>3,3-Dichlorobenzidine</u> <u>N-nitrosodi-n-propylamine</u> <u>**</u> <u>Please quantify:</u> <u>DIESEL AS - C12-C24</u> <u>MOTOR OIL AS - C24-C36</u> <u>gas as: C6-C12</u>			
<u>10036003</u>		<u>TRIP BLANK</u>		<u>11/21/10</u>		<u>0800</u>		<u>L</u>		<u>6</u>		<u>X</u> <u>X</u>			
<u>10036005</u>		<u>231E-S-02-25</u>		<u>1</u>		<u>1355</u>		<u>L</u>		<u>12</u>		<u>X</u> <u>X</u> <u>X</u> <u>X</u> <u>X</u> <u>X</u> <u>X</u>			
<u>10036006</u>		<u>SOURCE WATER DI</u>		<u>1</u>		<u>1500</u>		<u>L</u>		<u>6</u>		<u>X</u> <u>X</u>			
<u>10036007</u>		<u>SOURCE WATER TAP</u>		<u>✓</u>		<u>1510</u>		<u>L</u>		<u>6</u>		<u>X</u> <u>X</u>			
Shuttle Temperature: _____		Turnaround Requested: MUST CHECK ONE <input checked="" type="checkbox"/> <u>48 HRS PRELIM</u> <input type="checkbox"/> Standard (2-3 week) <input type="checkbox"/> One week <input type="checkbox"/> 24-48 hour		Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (30-day retention)				Relinquished by: <u>Patricia Walters</u> Date: <u>11/21/10</u> Time: <u>1610</u>				Received by: Date: _____ Time: _____			
Relinquished by: _____		Date: _____ Time: _____		Received by: _____		Date: _____ Time: _____		Relinquished by: _____		Date: _____ Time: _____		Received by: _____		Received at lab by: <u>[Signature]</u>	

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler



APPL Labs

Fax: (559) 275-4422

C.O.C. № 31979

White: Return to client with report Yellow: Laboratory Copy Pink: Sampler



APPL Labs
908 North Temperance Ave.
Clovis, CA 93611

Phone: (559) 275-2175

Fax: (559) 275-4422

CHAIN OF CUSTODY RECORD 25°C

C.O.C. N^o 30768

Report to: PLEASE PRINT Company Name: <u>KCH</u> Phone: <u>415-822-2253</u> Address: <u>1970 Broadway St. #10</u> <u>Oakland, CA 94612</u> Fax: <u>415-822-1329</u> Attn: <u>Patricia Walters</u>						Invoice to: PLEASE PRINT Company Name: <u>KCH</u> Phone: _____ Address: _____ Fax: _____ Attn: _____							
Project Name/Number <u>CT0003 Step Outs/105688</u>		Sampler (Print) <u>Patricia Walters</u>		Analysis Requested/Method Number				Date Shipped:					
Purchase Order Number <u>105688</u>		Sampler (Signature) <u>Patricia Walters</u>		<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"> SVOCs - 3550B-18270D PHTS-3550B1 8270D51M WAA-3050B 6010C Percent Moisture CUP </div> <div style="text-align: center;"> </div> </div>				Carrier:					
Sample Identification		Location						Date Collected		Time Collected		Waybill No.:	
												Comments: <u>Report soil results as dry weight.</u>	
<u>1006N027</u>		<u>214-Step-01-0.5</u>						<u>2-3-10</u>		<u>1352</u>		<u>② Don't put locations on EIS</u>	
<u>1006N028</u>		<u>214-Step-01-2.5</u>								<u>1406</u>		<u>* SVOCs consist of:</u>	
<u>1006N029</u>		<u>214-Step-01-4.5</u>								<u>1414</u>		<u>1,1,2,2-tetrachloroethane</u>	
<u>1006N030</u>		<u>214-Step-01-6.5</u>								<u>1437</u>		<u>1,1,4-DCB</u>	
<u>1006N031</u>		<u>214-Step-01-8.5</u>								<u>1440</u>		<u>3,3'-Dichlorobenzidine</u>	
<u>1006N032</u>		<u>214-Step-01-9.5</u>								<u>1442</u>		<u>n-Nitrosodipropylamine</u>	
<u>1006N033</u>		<u>214-Step-02-0.5</u>								<u>1507</u>			
<u>1006N034</u>		<u>214-Step-02-2.5</u>				<u>1518</u>							
<u>1006N035</u>		<u>214-Step-02-4.5</u>		<u>↓</u>		<u>1528</u>		<u>ms/msd</u>					
Shuttle Temperature:		Turnaround Requested: MUST CHECK ONE <input checked="" type="checkbox"/> 48hr prelim <input type="checkbox"/> Standard (2-3 week) <input checked="" type="checkbox"/> One week <input type="checkbox"/> 24-48 hour				Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (30-day retention)							
Relinquished by sampler: <u>Patricia Walters</u>		Date <u>7/3/10</u>	Time <u>1425</u>	Received by:		Relinquished by:		Date <u>7/3/10</u>	Time <u>20:00</u>	Received at lab by: <u>Yang</u>			
Relinquished by:		Date	Time	Received by:		Relinquished by:		Date	Time	Received at lab by:			

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler



APPL Labs
908 North Temperance Ave.
Clovis, CA 93611

Phone: (559) 275-2175

Fax: (559) 275-4422

CHAIN OF CUSTODY RECORD

Page 1 of 2

C.O.C. No. 30769

Report to: PLEASE PRINT Company Name: <u>KCH</u> Phone: <u>415-822-2253</u> Address: <u>1970 Broadway St. #10</u> <u>Oakland, CA 94612</u> Fax: <u>415-822-1329</u> Attn: <u>Patricia Walters</u>						Invoice to: PLEASE PRINT Company Name: <u>KCH</u> Phone: _____ Address: _____ Fax: _____ Attn: _____					
Project Name/Number <u>OTO 003 Reports/105688</u>		Sampler (Print) <u>Patricia Walters</u>		Analysis Requested/Method Number				Date Shipped:			
Purchase Order Number <u>105688</u>		Sampler (Signature) <u>Patricia Walters</u>		SVOCS* - <u>3550B/8270D</u> PAMS - <u>3550B/8270D</u> Lead - <u>3050B/6010C</u> Percent Moisture - <u>CLP</u>				Carrier: _____ Waybill No.: _____ Comments: <u>1. Report Soil Report based on weight</u> <u>2. Don't put location on file</u>			
Sample Identification	Location	Date Collected	Time Collected	Matrix	Number of Containers						
<u>1006N036</u>	<u>214-Step-02-6.5</u>	<u>2/3/10</u>	<u>1602</u>	<u>S</u>	<u>1</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>		
<u>1006N037</u>	<u>214-Step-02-8.5</u>		<u>1605</u>		<u>1</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>		
<u>1006N038</u>	<u>214-Step-02-9.5</u>	<u>↓</u>	<u>1609</u>		<u>1</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>		
<u>1006N0341</u>	<u>214-Step-03-0.5</u>	<u>2/4/10</u>	<u>1038</u>		<u>1</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>		
<u>1006N042</u>	<u>214-Step-03-2.5</u>		<u>1047</u>		<u>1</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>		
<u>1006N043</u>	<u>214-Step-03-4.5</u>		<u>1056</u>		<u>1</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>		
<u>1006N0484</u>	<u>214-Step-03-8.5</u>		<u>1128</u>		<u>1</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>		
<u>1006N0465</u>	<u>214-Step-03-9.5</u>		<u>1130</u>		<u>1</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>		
<u>1006N046</u>	<u>214-Step-03-6.5</u>	<u>↓</u>	<u>1216</u>	<u>↓</u>	<u>1</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>		
						* SVOCS consist of: Bis(2-ethylhexyl) phthalate 1,4-DEB 3,3'-Dichlorobenzidine n-Nitrosodim-n-propylamine					
Shuttle Temperature: <u>3.5°C</u>		Turnaround Requested: MUST CHECK ONE <input type="checkbox"/> Standard (2-3 week) <input checked="" type="checkbox"/> <u>One week Final</u> <input type="checkbox"/> 24-48 hour				Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (30-day retention)					
Relinquished by sampler: <u>Patricia Walters</u>		Date <u>2/4/10</u>	Time <u>1520</u>	Received by:		Relinquished by:		Date <u>2/5/2010</u>	Time <u>00:05</u>		
Relinquished by:		Date	Time	Received by:		Relinquished by:		Date	Time		

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler



APPL Labs
908 North Temperance Ave.
Clovis, CA 93611

Phone: (559) 275-2175

Fax: (559) 275-4422

CHAIN OF CUSTODY RECORD

Pg 2 of 2

C.O.C. No. 30774

Report to: PLEASE PRINT Company Name: <u>KCH</u> Phone: <u>415-822-2253</u> Address: <u>1970 Broadway St #10</u> <u>Oakland, CA 94612</u> Fax: <u>415-822-1329</u> Attn: <u>Patricia Walters</u>						Invoice to: PLEASE PRINT Company Name: <u>KCH</u> Phone: _____ Address: _____ Fax: _____ Attn: _____									
Project Name/Number <u>OTO 003 Step 02 / 105688</u>		Sampler (Print) <u>Patricia Walters</u>				Analysis Requested/Method Number						Date Shipped:			
Purchase Order Number <u>105688</u>		Sampler (Signature) <u>Patricia Walters</u>				<div>Lead - 301041 6010C</div> <div>PW 2/4/10</div> <div>PW 2/4/10</div> <div>PW 2/4/10</div>						Carrier:			
Sample Identification		Location		Date Collected	Time Collected							Matrix	Number of Containers	Waybill No.:	
1006N039		2M-Step-02-9.5		2/3/10	1635							L	1	Comments:	
1006N040		2M-Step-02-4.5		↓	1648								1	Don't put locations on FIs	
1006N047		2M-Step-03-4.5		2/4/10	1412								1		
1006N048		2M-Step-03-9.5			1420								1		
1006N049		SW-Tap			1450								1		
1006N050		SW-DI		↓	1456	↓	1								
Shuttle Temperature: <u>3.5°C</u>		Turnaround Requested: MUST CHECK ONE <input checked="" type="checkbox"/> 48 hr prelim <input type="checkbox"/> Standard (2-3 week) <input checked="" type="checkbox"/> One week final <input type="checkbox"/> 24-48 hour						Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (30-day retention)							
Relinquished by sampler: <u>Patricia Walters</u>		Date <u>2/4/10</u>	Time <u>1520</u>	Received by:		Relinquished by:		Date <u>02/05</u>	Time <u>2010</u>	Received at lab by:					
Relinquished by:		Date	Time	Received by:		Relinquished by:		Date	Time	Received at lab by:					

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler



APPL Labs
908 North Temperance Ave.
Clovis, CA 93611

Phone: (559) 275-2175

Fax: (559) 275-4422

CHAIN OF CUSTODY RECORD

C.O.C. No. 30776

Report to: PLEASE PRINT	Invoice to: PLEASE PRINT
Company Name: KCH	Company Name: KCH
Address: 1970 Broadway St 710	Address:
Oakland, CA 94612	
Attn: Patricia Walters	Attn:

Project Name/Number	Sampler (Print)	Analysis Requested/Method Number										Date Shipped:					
OTO 003 Step Outs/105688	Patricia Walters											Carrier:					
Purchase Order Number	Sampler (Signature)											Waybill No.:					
105688	Patricia Walters											Comments: Dirt pit locations on FIs					
Sample Identification	Location	Date Collected	Time Collected	Matrix	Number of Containers												
1006N039	214-Step-02-9.5	2/3/10	1635	L	3	X	X										
1006N040	214-Step-02-4.5	↓	1648	↓	3	X	X										
1006N047	214-Step-03-4.5	2/4/10	1412	↓	3	X	X										
*SUOCs consist of: Bis(2-ethylhexyl)phthalate for 3,3'-dichlorobenzidine h4-DCB N-nitrosodi-n-propylamine location: 214-Step-03-4.5																	

Shuttle Temperature: 2.5°C	Turnaround Requested: MUST CHECK ONE <input checked="" type="checkbox"/> 48 hr prelim <input type="checkbox"/> Standard (2-3 week) <input checked="" type="checkbox"/> One week <input type="checkbox"/> 24-48 hour	Sample Disposal: <input type="checkbox"/> Return to client <input checked="" type="checkbox"/> Disposal by Lab (30-day retention)					
Relinquished by sampler: Patricia Walters	Date: 2/4/10 Time: 1547	Received by:	Relinquished by:	Date:	Time:	Received by:	
Relinquished by:	Date:	Time:	Received by:	Relinquished by:	Date: 02/05/2010	Time: 00:05	Received at lab by:

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler

C.O.C. № 30777

[illegible]

White: Return to client with report

Yellow: Laboratory Copy

Pink: Sampler

Appendix E
Laboratory and Data Validation Reports (CD-ROM only)

This page intentionally left blank.

UNSCANNABLE MEDIA

To use the unscannable media document # 2253548
contact the Region IX Superfund Records Center

(1 OF 1)

Appendix F
Response to Comments Table

This page intentionally left blank.

Technical Memorandum for Data Gap Investigation of Soil Under Buildings on Parcel C Review - Response to Comments

Reviewer:				
Document:	Draft Technical Memorandum for Data Gap Investigation of Soil Under Buildings on Parcel C, Hunters Point Shipyard			
Date Reviewed:	7/1/2010			
Contractor:	CH2M Hill-Kleinfelder Joint Venture			
Contract Number:	N62473-09-D-2622			
General Comments:				

Comment Number	WS/page	H/L	Comment	Response to Comments
Navy QAO Comments and Contractor Responses				
Regulator Comments and Revisions Made				
Comment Number #	Section/ page	Comment Made By	Comment	Response to Comments
1	Section 4.2.2 - Step-out Boreholes	California Dept. of Toxic Substances Control (DTSC)	The criteria / rationale used to select the specific step-out boring locations should be provided in the text. The referenced Final Sampling and Analysis Plan only describes the criteria that was used to determine if step-out sampling was warranted.	The text in the first paragraph of Section 4.2.2 has been modified to read as follows: "Step-out locations were based on the decision criteria presented in Appendix B of the Final SAP (KCH, 2009c). Since the initial sampling indicated the presence of contaminants above the remedial goals, additional samples were deemed necessary. Previous analytical data in the area was assessed including the recent boring and three locations were selected as step out locations. These locations were plotted on a map and presented to the BCT for concurrence during the January BCT meeting. The BCT accepted the locations and the step out sampling was completed."
2	Section 4.2.3, Deviations from Final SAP	DTSC	The rationale for moving the initial Building 214 sampling location should be provided in this section.	Borings were advanced as close as feasible to the locations indicated in the WP/SAP based on site access, identified utilities, building access and other issues. No text changes were made in response to this comment. The following sentence was added to the last paragraph of this section: "These deviations from the Final SAP did not affect the project objectives".
3	Section 7.4 - Recommendations, Building 231E	DTSC	The recommendation of no further action for the locations investigated in this area based on the lead result being below the action limit of 2X the remedial goal may not be appropriate at this time. The lead exceedance above the draft Parcel C ROD residential remedial goal along with the additional data in the vicinity of sample 231 E-S-01 may warrant additional remedial action (for example, institutional controls or removal). An evaluation that includes the additional data already collected in the vicinity of the building may help support the current recommendation.	The text has been revised to remove the recommendation for no further action for Building 231E.
4		DTSC	The Draft Memo should briefly describe and present any air monitoring information collected during sampling using the photoionization detector (PI D).	The following text has been modified in the last paragraph in Section 4.2.1. "Upon retrieval, the acetate sleeves were cut open, samples were collected for analysis, soil cores and ambient air were screened using a PID for H&S purposes, and described by the field geologist using the Unified Soil Classification System (USCS) on borehole logs. Graphical logs of boreholes are presented in Appendix C."
5	Figures 5a and 6	DTSC	Please consider changing the concentrations exceeding the Draft Parcel C Record of Decision residential criteria from italics to bold in order to more clearly identify these results in the figures.	The requested change has been made to the Figures.
General Comment #1		RWQCB	Consistent Units for Laboratory Analytical Results and Remedial Goals For consistency, throughout the text, tables, and figures, please use the same units for chemical concentrations in the soil samples as are used for the remedial goals (RGs) for soil, presented in the <i>Draft Record of Decision</i> for Parcel C, April 2, 2010 (<i>Draft ROD</i>).	The units for chemical concentrations in the Text, Tables and Figures have been changed to be consistent with the ROD.
General Comment #2		RWQCB	Wording Related to Non-Detect Results The wording related to the apparent non-detect results of chemicals in the samples is confusing. For instance, the reader may not understand that the phrase "TPH-P was not <u>reported</u> at concentrations above the MDL..." on p. 5-2 means that TPH-P was not <u>detected</u> (above the MDL). Please consider re-wording to clarify the meaning for the reader.	The text has been modified, where appropriate, to "not detected".

Technical Memorandum for Data Gap Investigation of Soil Under Buildings on Parcel C Review - Response to Comments

Comment Number	WS/page	H/L	Comment	Response to Comments
Navy QAO Comments and Contractor Responses				
Regulator Comments and Revisions Made				
Comment Number	Section/page	Comment Made By	Comment	Response to Comments
General Comment #3		RWQCB	Screening Criteria for the Petroleum Program The use of the phrase "TPH CAP criteria" and citation of that document is confusing since there is no current draft TPH CAP for Parcel C. The screening criteria for TPH are presented in the <i>Final New Preliminary Screening Criteria and Petroleum Program Strategy</i> dated December 21, 2007; this is included in Section 8.0 (References). The appropriate screening criteria for specific sites are identified based on both land use and whether the groundwater is considered as a potential source of drinking water or not. For instance, in the notes on Table 2 for example, it should state whether the water resource is considered drinking water. Throughout Section 5.0 (Soil Analytical Results), the "TPH CAP" Tier 1 criteria that data results are compared to are the lowest residential use/drinking water resource criteria. Since there is no mention of whether the groundwater is considered a potential source of drinking water or not, it is not clear that these are the appropriate criteria. Either provide adequate support for selection of those criteria, or, alternatively, if those particular Tier 1 criteria were selected solely because they are the most conservative, please state that in the text and tables.	The "TPH CAP" Tier 1 criteria was chosen because it is the most conservative, the text and tables will be modified to include the following statement where applicable: "Results were compared to the TPH CAP Tier 1 criteria because they represent the most conservative criteria available for the TPH CAP".
Specific Comment #1	Section 2.4 (Summary of Previous Investigations and Remedial Actions), p. 2-6	RWQCB	Please indicate why Building 214 was later added to the initial list of 12 buildings that required additional evaluation	The Navy, EPA, DTSC, City and County of San Francisco, and Lennar held a meeting on May 27, 2009, to discuss the adequacy of chemical analytical data for CERCLA chemicals of concern (COC) in soil under buildings that were identified in the Final Feasibility Study for Parcel C as areas requiring a soil management plan (Buildings 134, 231, 272, 275, and 281), as well as additional buildings in Parcel C (Buildings 203, 205, 217, 241, 251, 253, and 258). After this meeting, the Navy also evaluated the footprint of Buildings 211 and 214 based on comments received on May 27, 2009. As a result, the Navy agreed to conduct a soil data gap investigation within the footprint of Buildings 134, 203, 214, and 231 to collect additional soil samples for chemical analysis for specific COCs. The soil sampling was completed in February 2010. Chemical analytical results of the data gap investigation indicated that only polycyclic aromatic hydrocarbon (PAH) and lead at one sample location within Building 214, and lead at one sample location within Building 231 exceeded Parcel C soil remediation goals. The result that exceeded remediation goals within Building 214 was subsequently bounded by step-out samples collected outside of the building. As a result of this investigation, Building 214 will be added to the list of buildings that will need further action if the building foundation is removed.
Specific Comment #2	Section 2.4 (Petroleum Program Strategy, Step 4 -- Perform Risk-Based Screening Evaluation), p. 12	RWQCB	Historical Soil Sample Results -- Include the laboratory analytical results for the historical soil samples that triggered inclusion of buildings in this data gap investigation.	A summary of historical laboratory analytical results for soil samples are provided in Appendix B of the WP/ SAP
			Dibenz(a,h)anthracene Remedial Goal -- The Tech Memo tables list the RG for dibenz(a,h)anthracene as 2,000 ug/kg, but the Draft ROD lists the RG as 0.33 mg/kg (both residential and industrial direct exposure). Please check and correct, as appropriate.	We have corrected the RG in the tables for Di(ah)A to 0.33 mg/kg
Specific Comment #3	Section 7.0 (Recommendations)	RWQCB	Although I understand that Petroleum Program recommendations are not be included as part of a CERCLA Program document, it would be helpful to the reader if a brief statement that or how the appropriate petroleum data are going to be transferred/shared with the Petroleum Program.	Inclusion of petroleum program recommendations is outside the scope of this project. Data from this investigation will be reviewed and analyzed by the TPH CAP in forthcoming documents. No text changes were made in response to this comment.

Technical Memorandum for Data Gap Investigation of Soil Under Buildings on Parcel C Review - Response to Comments

Comment Number	WS/page	H/L	Comment	Response to Comments
Navy QAO Comments and Contractor Responses				
Regulator Comments and Responses Made				
Comment Number #	Section/ page	Comment Made By	Comment	Response to Comments
Specific Comment #4	Figures	RWQCB	Sample Depths – Add a note indicating that the sample depths are presented in feet below the concrete slab.	The requested change has been made to the Figures.
			Location of Key Historical Soil Samples – Illustrate the location and results of the historical soil samples for which the analytical results exceeded the RGs and which triggered inclusion of each building in this data gap investigation	See response to RWQCB Specific Comment #2.
			Angle Boring – An angle boring was drilled adjacent to Building 214. Illustrate both the horizontal location of the surface start point and the estimated horizontal location of the subsurface termination point for the angle boring. Also, in the “Notes” section, please indicate whether or not the sample depth has been adjusted for the angle at which the boring was advanced.	The requested change has been made to Figure 5a. The following note has been added to the figure: “The sample depths have been adjusted for the angle at which the boring was advanced.”
Specific Comment #1	Section 1.1, Project Objectives:	EPA	The first paragraph states that building foundations will be considered part of the “institutional controls”. Since the physical building foundations are not legal or administrative controls, the building foundations should be referred to as “engineering controls”.	The requested change has been made to the text.
Specific Comment #2	Section 2.2, Physical Setting:	EPA	The final sentence states that “the storm drains and sanitary sewer lines beneath the parcel remain key site characteristics.” Please note in the text that both the storm drain lines and sanitary sewer lines will be removed.	The following sentence was added at the end of Section 2.2: “Storm drain and sanitary sewer lines in Parcel C will be removed per the Parcel C Remedial Action.”
Specific Comment #3	Section 3.1, Principal Decision Makers:	EPA	Please revise this section to clarify that the U.S. EPA co-selects the remedy.	The following sentence has been inserted after the second sentence in Section 3.1: “USEPA co-selects the remedy.”
Specific Comment #4	Section 4.2.3, Deviations from the Final SAP:	EPA	This section should briefly discuss how the deviations from the Final SAP affect the project objectives.	The following sentence was added at the end of Section 4.2.3: “These deviations from the Final SAP did not affect the project objectives.”
Specific Comment #5	Table 4:	EPA	The shading used for cells with values exceeding the draft Parcel C ROD remedial goals (RG) is difficult to see. Please either darken the shading or add color highlighting to tables where the RGs are exceeded.	Shading of the appropriate cells in Table 4 has been darkened.
1	Section 4.2.2, Step-out Boreholes	City and County of San Francisco Department of Public Health (SFDPH)	This section states that “three additional boreholes were advanced adjacent to Building 214. Step-out locations were based on the decision criteria presented in Appendix B of the Final SAP.” The Final SAP does not include any appendices, and Appendix B of the Final Work Plan (which includes the Final SAP as Appendix A) does not provide the referenced information. Please make the appropriate correction to the text. Also, please provide a more detailed description here of how the step-out locations were chosen.	See response to DTSC comment Number 1
2	Section 4.2.3, Deviations from Final SAP	SFDPH	The sampling locations shown in Figure 4 of this report do not match the proposed sampling locations shown in Figure 10-4 of the Final SAP. Please discuss in this section the reason(s) for the changes in the locations of samples 203-S-05 and 203-S-06.	Borings were advanced as close as feasible to the locations indicated in the WP/SAP based on site access, identified utilities, building access and other issues. No text changes were made in response to this comment.
3	Section 5.4, Building 214 Step-out	SFDPH	The text indicates that six (6) samples had naphthalene concentrations above the TPH CAP Tier 1 criteria. Table 4 presents the six sample locations/results, including two samples in which the compound was not detected (naphthalene), but the non-detect results were reported with elevated reporting limits that exceeded the TPH CAP Tier 1 criteria. Please discuss the naphthalene results and their relationship to the TPH CAP Tier 1 criteria.	The text indicates that six (6) samples had PAH/SVOC detections above the Draft Parcel C ROD or TPH CAP Tier 1 Criteria. Naphthalene was not identified as the only PAH/SVOC detected above said criteria. No text changes were made in response to this comment.
4	Section 7	SFDPH	Recommendations: Given that data were collected during this program to support a new TPH CAP for Parcel C, please provide at least a brief statement as to how and in which step of the TPH CAP program’s process the petroleum hydrocarbon-related data collected as part of this program will be utilized.	See response to RWQCB Specific Comment Number 3.
5	Section 7.3	SFDPH	Recommendations – Building 214: Please provide a figure showing the anticipated extent of additional removal actions for soil that would be required under and adjacent to Building 214, based on both historical sampling results and the sampling results obtained during this program “if the building is demolished and the foundation removed”.	The requested information will be developed in future remedial design documents.

Technical Memorandum for Data Gap Investigation of Soil Under Buildings on Parcel C Review - Response to Comments

Comment Number	WS/page	W/L	Comment	Response to Comments
Navy D&C Comments and Contractor Responses				
Revisions Made				
Comment Number #	Section/page	Comment Made By	Comment	Response to Comments
6	Figures 3 through 6, Soil Sampling Locations and Results	SDFDH	Please include the historical soil sampling locations and analytical results exceeding criteria in these figures; this will enable the reader to see the historical sampling results that were the genesis of this sampling program and how the results of this program have or have not resolved those concerns, i.e., whether the extent of soil contamination is now adequately bounded (4th paragraph, p. 2-6) and whether the footprints of any of the four buildings may need to be designated as ARICs (1st bullet, page 2-7).	See response to RWQCB Specific Comment Number 2.
7	Figure B-2, Revised Excavation Footprints in Parcel C	SDFPH	Please provide a reference (report title and figure number and title) for the "proposed excavation area" and "proposed SVE area" shown in this figure.	The figure was provided by the Navy as background information for this scope of work. Information provided in Appendix B is from the <i>Draft Record of Decision for Parcel C, Hunters Point Shipyard, San Francisco, California, April 2, 2010. - Figure 10 Planned Soil Remediation</i>
Other revisions made by Contractor				